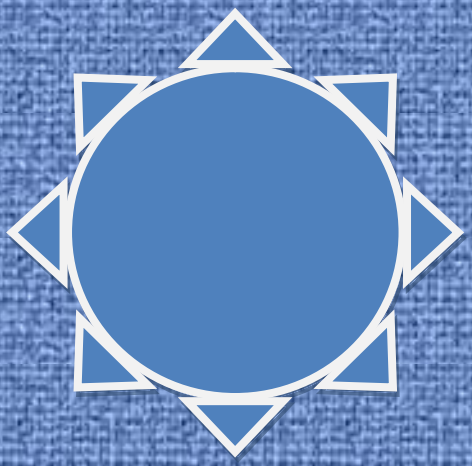
A.P. MARYUKHIN

HISTORY AND STRUCTURE OF LANGUAGES



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Acknowledgment

This book is the first in the series of Russian Linguistic Unity. I open the section with large program for further linguistic and philosophical investigations. My aim is not to discover something new but explore forgotten ideas, throw light on what was done centuries before with some extension in recent studies.

In my book, I do not pretend on full exclusiveness of the given information. I tried to elucidate as far as it can be the current tendency in philosophy of science. I give manifold References at the end of each section so that the reader enables to proceed by herself/himself. Some references are included into the text through quotations, and some are merely listed beneath.

I express my gratitude to the Krupskaya Scientific Library for big collection of excellent books in philosophy of language.

PROLEGOMENA TO SCIENCE OF LANGUAGE

Since ancient times, science has been searching for objective and non-contradictory methods. Today, scientific knowledge expressed by the natural language becomes more anthropogenic than before. Unifying a complex of available interpretations or alternative answers, contemporary science has reached a lot. Yet preliminary results remain invalid in virtue of language rules. Whether science enables to settle these problems, it concerns further revision of the physical picture of the world.

In the natural sciences, we expect that any active sphere does not embrace the human society-as-a-whole. If we try to mark with the letters *H* and *S* human and natural scientific knowledge, the boundaries between them will not be rigid. In the natural sciences, *H* may be both an observer and a participant of scientific process. This duplicate procedure unifies the natural sciences with the humanities; a physicist explores laws of nature, and a linguist deals with their verbal meanings. But while the physicist creates a law, the linguist explains words, which are merely an abstraction, a chain of spoken and perceived sounds. As a result, philosophers necessitate such a symbolic language, which would satisfy any physicist. Language-as-a-whole-organism might have resolved this task the best way. Leibniz, Boole, Frege, Carnap, Korzybski and others have made first steps in this direction.

Mr Carnap divided the natural language into that of object and theoretical. He assigned to the object-language terms of observation ("hot", "heavy") and "dispositional" predicates ("flexible", "soluble"). Theoretical language consisted in its turn of terms, predicates, and statements of the object language. So-called "quasi-syntactical sentences" induced sentences of the object language ("Five is a number") or metalanguage ("Five" is a number, i.e. a numeral). Further Mr Carnap divided all the sentences into three main classes: unscientific, non-scientific, and scientific; the last ones could be true or false. Metaphysical sentences as pseudo-sentences were not confirmable or expressible in scientific language; they did not refer to unperceivable reality, either. Mr Carnap distinguished between the object language and syntactical language. The former is a language of the natural sciences; the latter is a formalized language as well. All characteristics of empirical world are expressed in the object language. And "since all constituent parts of it find recognition and expression in syntactical language, it is no longer necessary in linguistic analysis to differentiate between discourse and empirical reality. The only significant distinction is that between the material and the formal mode of speaking (which pertains to terms)"[1].

[1] *Werkmeister W*. A History of Philosophical Ideas in America. – N.-Y., 1949. P. 570.

Mathematicians formed their own language. Mr Boole distinguished between spoken and symbolic language being inherent to the exact sciences. Mr Boole was sure that "while exploring signs (symbolic language) we cognize general laws of reasoning because mind's principles suit to laws with logical symbols as extra source for real thought's investigation"[1]. Aristotle had introduced logical symbols many centuries before. But Mr Leibniz applied them both to variables and logical constants some centuries later. His follower Mr Frege composed a language where logical terms such as *if, all, identical* were used in predicative calculus[2]. Syntax of such a language depended on the rules of symbols. Frege's system rested upon Leibnizian idea to combine all valid inferences with mechanical phase and served for "pure thinking" with no words for observable objects or relations.

We have no task to build a universal language. We intend to develop the theory of meaning, the view by which Messrs Richards and Ogden have shown on example of semantic triangle that relation between words (symbols) and objects (the reference) is indirect[3]. Linguistic world has not been waiting for a long, reacting on these ideas with cognitive researches. Applying the term "linguistic relativity", philosophers declared that Chinese thought differed from that of Western. For example, Mr Chang considers there is no subject or the verb *to be* in the Chinese language. Mr Chang says, "Chinese logic does not rest upon a system of identity in opposite to West-European logic. Chinese thought does not pay attention to the rule of Excluded Middle and grasps instead a qualitative relation between words *above-under, good-bad* and so on"[4]. But we see how Mr Chang confuses logic with dialectics. Any logic does not make difference between a subject and a predicate. Moreover, the variety of language forms does not reveal the difference in thought. In linguistics as well as in physics the principle of complementarity substitutes in this way the principle of relativity. In this respect, Mr Quine defines world partition through all lexical and grammatical tools. All languages have nouns, verbs, and referentials, singular and plural forms; however, if we do not find some universals, it is not a reason for creating a new picture of the world.

The dispute around the "word meaning" has apparently started between materialists and relativists. The first define it as a relation to real objects. The second mean that although a sign consists of sound substance, it cannot refer to the exact word meaning. As a result, say, there is no interjacent concept *map* between the word *map* and those objects this word refers to. Some linguists suggest that any concept represents a fact merely through specific properties. The others think words and sentences are symbols without definitive content (e.g. "a map" is not the whole territory). In philosophy of science, we can draw here a parallel between the terms "subjective"/"objective". For example, a dualistic character of length is not that how a person

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[1] *Boole G.* An Investigation of the Laws of Thought on Which are Founded the Mathematical Theories of Logic and Probabilities. – N.-Y., 1854. P. 24.

[2] *Frege G.* Schriften zur Logik. – Berlin, 1973.

[3] *Ogden C.*, *Richards I.* The Meaning of Meaning. – N.-Y./London, 1923.

[4] *Chang T.S.* Chinesen denken anders // Wort und Wirklichkeit. – Darmstadt, 1972.

measures it (objective meaning) but that the physical space does not possess, in opposite to Ryman space, its own metric (subjective meaning).

After "building" the theory of meaning, a linguist usually neglects the fact whether there are objects beyond the language and whether we may speak of non-linguistic environment. The meaning of words usually remains within the dichotomy "language/speech" and "discoursive space" (context), so that any word consists of absolute (significative) and relative value (meaning); signification connects the word with non-linguistic reality, while the meaning refers to some linguistic system. In other words, we get[1]:

Cognitive meaning	*Non-cognitive meaning*
Purely formal	Imaginative (icon)
Logico-arithmetical	Emotional (affective)
Factual (= Empirical)	Motivational (directive)

Non-cognitive meaning is assigned to metaphysical statements, while cognitive meaning one extracts from empirical knowledge, which avoids mistakes of psychological character. The meaning of words is then denoted due to a method by which they are used and formalized. The logical analysis goes beyond the closed definitions of common language and differs from that of philological at least in three points. First, the logical analysis refers to the concepts of primary importance. Second, the logical reconstruction is independent of language grammar both existent and non-existent. Third, the logical analysis is a direct analysis; it is an axiomatic method (like in mathematics or empirical sciences) or reductionism.

For a positivist, "every word and every phrase of colloquial language mean a dissection of the world into three classes. The first class consists of things or situations to which the word, according to the existing linguistic conventions, applies without any doubt. The second class comprises those things for which the word in question is definitely not meant. The third is formed by those phenomena for which the linguistic conventions are not sufficient to enable one to decide whether or not the given expression applies. This holds for the simplest words such as *table* and *bed, above* and *below*, as well as for more complicated terms such as *cause* and *effect*, *body* and *soul*"[2].

Looking inside the theory of meaning, we will distinguish between logically true and logically false sentences excluding from this range[3]:

a) sentences with broken syntactical rules ("Nor here I you neither was");

b) contradictions ("Octogenarians are sometimes more than ninety years old");

c) sentences with extralogical concepts, which do not provide operational definitions ("The true essence of electricity is undiscoverable");

d) sentences whose confirmation is impossible (metaphysical realism).

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[1] *Feigl H.* Logical Empiricism // Readings in Philosophical Analysis. – N.-Y., 1949.

[2] *Mises R. von*. Positivism. A Study in Human Understanding. – N.-Y., 1951. P. 4.

[3] *Feigl H.* Logical Empiricism // "Readings in Philosophical Analysis". – N.-Y., 1949.

The statements of science referring to the objects are called “universe of discourse”. In scientific language, equal relation exists between singular and derived reference, between signs for individual objects and classes. The first group consists of individual concepts (“mountain Everest”, “the highest mountain in the world”), the second includes class concepts (“water”, “metal”, “atom”, “nation”). Ex.: If “*a* is (Pa)”, then *a* stands for singular terms, *P* – for general terms.

In scientific language, we also separate signs referring to personal names from signs-descriptions with abstract meanings. In this attitude, Mr Ryle pointed on the absurdity of parallel relation between names and descriptions. If “Fido” is a dog’s name, it refers to the dog *Fido*. But to say the word *dog* refers to objects the same way as *Fido* to “Fido” means it also refers to all classes of real and imaginable dogs. Thus, every word is a complex of descriptions, although such words as *atom, red, full, greater than* are words without denotation.

***

Partially I introduced this book as PhD thesis at the Institute of Linguistics of the Russian Academy of Sciences (RAS); partially it is a translation of my monograph “Science and Language. Experience of Logical Empiricism” (2015). I am grateful to Prof. Stepanov who has offered me to examine a new linguistic phenomenon for unifying subjective and objective viewpoints in science – “HEDGING”. This phenomenon was in use in science since Mr Lakoff applied this concept to “words whose job is to make things fuzzier”[1]. Lexical shifts (“hedges”) gain their senses by interaction between author and reader in a written text or communication. “Shifts” have high subjectivity controlled by the culture. By intercultural communication, they cause misunderstanding, because author and reader may not share the same norms. On the other hand, “hedges” are used to stress objectivity, politeness, or respect. Applying lexical shifts depends upon a text or speaker’s position; the category of “hedging” expands according to the principle of complementarity as well.

Chapter IV of the Part II is devoted to Prof. Stepanov and problems of IE syntax. I have traced the main ideas in this important branch of philological study from various standpoints.

I hope the present research contributes to the Unity of Science. My previous book published at “Progress-Traditsiya” in Moscow was among the first big issues in Russia on the matters of logic, language, and reality from viewpoint of empiricism. It has been discussed in November 2016 at the Day of Philosophy in Astrakhan Scientific Library. In present work, you will find materials devoted to it. I will be obliged for critical remarks and further collaboration dedicating this study to everyone involved into matters of human communication.

Astrakhan, October 2019

[1] *Lakoff G.* Hedges: Study in Meaning Criteria and the Logic of Fuzzy Concepts // Papers from … Chicago Linguistic Society. – Chicago, 1972. V. 8. P. 195.

PART I
ORIGIN OF LANGUAGE

CHAPTER ONE
PRIME ELEMENTS OF LANGUAGES

1.1. Onomatopoeia

The idea that there is a natural correspondence between sound and sense has been a favourite one with many linguists. They believed that language expressed mostly emotions. It was as they think exclamative, echoic and not communicative. The association with meaning was immediate and easy, first words were concrete, objective and specific. Among these linguists, one can find such names as Mr Farrar, Mr Kleinpaul, Mr Bergmann, or Mr Regnaud. Even in Indian linguistics, some suggest that primitive roots were obtained by onomatopoeia, i.e., by an imitation with the human voice of the sounds of inanimate nature. The other linguists, including those who support idealistic viewpoint, conclude that the connection between sound and meaning is arbitrary, and that there is nothing in the sound to indicate the meaning. I support this way of thinking, because sounds by themselves have no inherent connection with the objects denoted. The third tendency reflects accidental association of sounds becoming regular and conventional.

If we look at onomatopoeia closer, we will notice it is not in the same degree in languages; it is rather observable in the Semitic than in the IE family. The following illustrations made by Mr Bahri show how sounds gain a sensible meaning: "*áp*, 'water' ([á] – from all sides, and [p] – protecting); *ghan*, 'dense' ([gh] – concentrated, and [a] – void darkness); *car*, 'to move' ([c] – again and again, and [r] – movement outside); *bhaga*, 'the sun' ([bh] – light, and [g] – moving light); *bhú*, 'the universe' ([bh] – light, and [ú] – distant)".

Mr Pincott gives another example of the sound *i* = 'move', transformed into the form *ri* = "go quickly". The word *ri* then would gradually lose its intensive power, and at last be used as synonymous with *i,* "go". Or the sound *pa* would convey an idea like "forth", "forward", etc., and, as a matter of fact, the letters *p, v, f* (which mutually interchange) enter into a large number of words having such a meaning. Now, by simply prefixing this sound *pă* to *ri* we orally describe the idea "forward-go" or "move-on". It seems certain that such was the origin of the Sanskrit base *pri,* to "go" "forth", "expand"; and of the Sanskrit preposition *pra,* the Latin *per*, the Teutonic "for", "forth", "fore", etc.

Mr Farrar comes to the idea that "onomatopoeia, as a theory of the formation of language, is something more than a hypothesis. It often rests on induction; and it furnishes a remarkably close analogy to other processes of the human mind. Onomatopoeia can be found even in a metaphorical expression by sounds borrowed from the outer world". As we see from Farrar's study, these sounds were initially the natural sound-cells in which thought was quickened and developed into perfect speech. To

approve this fruitful investigation, we refer the reader to Pincott's index of onomatops:

G onomatop of throat, swallow, eat, bite, incise, seize, grasp, drag, draw, engrave: *gal,* "eat", Skr.; *gula, gustus,* Lat.; *gueule,* Fr.; *greedy, gorge, gnawing, disgust,* Eng.

I a definer of that which is proximate-self-unity-motion towards the speaker-motion in general: *I,* Eng.; *iha,* "here", Skr.; *ibi, idem,* Lat.; *ici,* Fr.

L onomatop of tongue, and the tongue's operations, licking, smearing, shining, brightening, liking, attaching, binding: *lai,* "tongue", Cochin-Chinese; *lih,* "lick", Skr.; *lap,* "speak", Skr.; *lu'âb,* "viscosity", Arab.; *likh,* "write", Skr.; *lip,* Eng.; *light,* Eng.; *relish,* Eng.; *leash,* Eng.; *link,* Eng.; *la,* "law".

P onomatop of puffing, blowing-a forward puff of breath, motion forward, extending, filling, broadening: *phu,* "blow", Dardu ; *puff,* Eng.; *phût,* "puff", Skr.; *pufîdan,* "blow", Pers.; *pulsum,* Lat.; *push,* Eng.

P onomatop of in-sucking, drinking, nourishment, strengthening, power, lordship: *pî, pâ,* "suck", *payas,* "milk", Skr.; *pino,* Lat. *Pabulum,* Lat.; *pûd,* "food", Pers.; *pasture, pastry,* Eng. *Power,* Eng.; *puissant,* Fr.; *pati,* "lord", *pitṛi,* "father, the nourisher", *putra,* "son, the nourished", Skr. ; *panah,* "protector", *pîr,* "old man", Pers.

T onomatop of definition, that which is exterior to self, the second person, the other, there, beyond; as an intensifier: *the*, *he, thee, thou, that, there, two, twice, twisting,* Eng.

Etc., etc., etc.

This onomatopoeia can be observed in various parts of discourse, but there are parts where it is dangerous: it is the noun and the verb. In fact, their forms are altered, and to find out if there is onomatopoeia, we have to get the first root. For example, in the Sanskrit *duhitar*, we cannot ask ourselves whether there is any relation between phonemes and the idea of *filli*. We would be misled: the root is *duh – traire* (fr); even less can we compare *duhitar* to *filia* (lat). But this danger is not very great, if one looks at the word *tochter* (de), which is the transformation of *duhitar*. Likewise, we must not purely observe the Germanic radical *sohn* (son), but first bring it back to the radical *su*. On the other hand, thanks to semantics, the meaning of words has varied considerably, and sometimes even one meaning is diametrically opposed to the initial consideration. This is how the Sanskrit word *adri* means "cloud", "song", "mountain", "sun", "tree" at the same time; it is first necessary to clarify the primitive meaning. Or if we take the simplest words *pa-ter, ma-ter* we see that Sanskrit makes *pa* (dad) and *ma* (mom) derive from the verbs *pa* – "protect", "nourish", and *ma* – "measure", "create", while, according to the analogy of the other languages, it is the idea of nourishing that would derive from that of *father*. There have been shifts of language that make the investigation uncertain. And it is the very case of subjective onomatopoeia.

One would think that in abstract and relational words subjective onomatopoeia is less frequent, and that these words must be close to conventional signs; that would be a mistake. Some of words, personal pronouns, are very old, essentially subjective in nature, as we have shown elsewhere, and still retain the archaic state. Also simple adverbs, signs of negation or interrogation are of this kind.

But if the subjective onomatopoeia is the factor of words formation, it will follow that the greater part of the languages must possess for the same simple idea the same primitive root. This is inevitable. It will be the proof of our theory. If the roots, purported to result from the subjective onomatopoeia, are different, it is that the onomatopoeia does not exist in reality. However, this reasoning should not be taken too far. Below we shall see how the theory of onomatopoeia has transformed into developed language structure. Onomatopoeia was the primeval tendency of language. It provided us with all elementary words, so that without the aid of imitation the earliest communications of mankind must have been meaningless.

1.2. Raw Material of Words

When men became conscious, words got lexicological development. Whole families of words were formed; and the languages, after having constituted themselves in this second period, were subjected to the laws, which govern intellectual things. At first, the notions or the meanings of words expanded and changed. By this fact, the etymological meanings of the words were forgotten. Then the words became what they must be by their nature and in practice, simple signs, or symbols, to which personal information attaches.

There are no idioms preserved from the first period of formation. All languages have already passed into the second period, and most of them have entered the third. Languages formed their themes under the influence of man's consciousness by the natural relation between sounds and their meaning. To express sensations or simple notions languages formed the simplest themes, that is, words composed of a single consonant; Skr. *Ga* (movement) "go". To express complex notions languages composed themes of two consonants; Skr. *HaGa* (protruding movement) "arise". Finally, there are themes of three consonants; Hebr. *BaRaK* (movement protruding into a thing) "burst".

In all languages, there are monosyllabic themes or words composed of a single consonant. But most of the themes in different language families are of two syllables, or consist of two consonants. In Semitic languages, primitive themes are composed of three syllables. These idioms add to the bissyllabic themes a third prepositive or postpositive consonant to determine more by its own meaning. In the Chinese language, words are generally monosyllabic, although most of them do not express simple notions, or sensations, but complex or compound notions. How is to explain this monosyllabism? If one admitted that monosyllabism was peculiar, it would be then necessary to suppose there were harmonic and parallel formation of signification or idea from one side and the expression of this meaning by the consonants from the other. What is more probable is to admit that many words, originally bissyllabic, have become monosyllables. The pronunciation first cut off the final vowel later had the final consonant. Thus, for example, the words, which in the Mandarin language are pronounced *cha, che*, *la*, etc., in the Canton dialect will be *chat, chet, lap*, etc.

In languages, where words do not have grammatical forms and where the logical value of words occupies relative position in the sentence, syntax is more regular than in idioms, which distinguish grammatical forms. In Chinese, syntactical rules can be reduced to one principle. Every word, following the subject, is a complement of proposition, and every word, preceding the subject, is a qualifier. If, for example, *jin* (man) is the subject, the theme *chan* (excellent), placed after it, forms the proposition, verbal attribute; *jin chan* (excellent man) means "the man excellent", "the man excels". If, on the contrary, *chan* precedes *jin*, it is a qualifier or an adjective of the subject, and *chan jin* means "excellent man". These rules are based on the same principle for compound words in synthetic languages. Therefore, the determinative word always precedes the definite word, so that the main meaning or logical accent rests on the last term. In Sanskrit, one could form, for example, the compound word *Daiva-dâsa* (God-servant) to say "servant of God". The main idea is the word *dâsa* (servant) placed at the end while the word *Daiva* (God), expressing determinative or accessory idea, is placed before the word whose logical extent it limits. Let us instead of "Daiva-dâsa" say "dâsa-Daiva". The meaning of this compound word will be changed; instead of signifying "servant of God", it will mean "God of servant". This rule of composition is found in all synthetic languages.

But how is the raw material of words formed? How and why do themes mean what they mean? It is to ask what is the relationship between the metaphysical part, or the meaning of the word, and its physical part or the vocal sounds. When it comes to the formation of language or words, the metaphysical part or the meaning obviously exists before the physical part or the vocal sounds. It is a question of finding the physical form to express the metaphysical background. In human language, this physical form is a vocal form expressing the sensations conceived in the soul.

Sometimes this relation between signification and the vocal sounds can have pure convention. Mr Chapin writes, "Words containing as their radical the letters *Fl* denote "fluency"; *Cl* – "a gentle descent"; *K* – what relates to "rapid motion"; *C* – "cavity" or "hollowness". Words formed upon *St* always denote "stability", "firmness", "strength" (*stand, stay, stop, staff, stout, steady, stake*). Words beginning with *Str* intimate violent force and energy (*strive, strength, strike, stripe, stress, struggle, stride, stretch*). *Thr* implies "forcible motion" (throw, throb, thrust, through, threaten, thralldom). *Wr* presupposes "obliquity" or "distortion" (*wry, wrest, wreath, wring, wrong, wrangle, wrack*). *Sw* means "silent agitation" or "lateral motion" (*sway, swing, swerve, sweep, swim*). *Sl* denotes "a gentle fall" or "less observable motion" (*slide, slip, slay, slit, slow, slack, sling*). *Sp* refers to "dissipation" or "expansion" (*spread, sprout, sprinkle, split, spill, spring*). Terminations in *ash* indicate something acting "nimbly" and "sharply" (*crash, gash, rash, flash, slash*). Terminations in *ush* indicate something acting more "obtusely" and "dully" (*crush, brush, hush, gush, rush, push, blush*)".

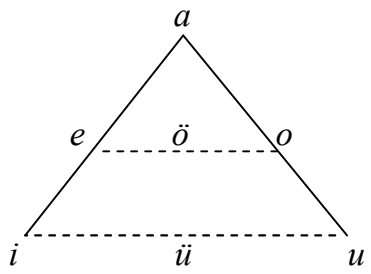
Nevertheless, in order to establish a convention, it is necessary to understand each other, to have a language to make oneself understood, and to agree on such and such a thing between several men. The essence of human language, in fact, is not to be immediate expression of sensation by cries and exclamations, but the mediated

expression of sentiment and notion by vocal sounds more or less articulated. What a great difference is there between the exclamation *o!* and the statement "I suffer!" that corresponds to it! The cry and the interjection are rather a part of the exclamatory language of the animal than of the analytic language of the man. It is therefore necessary to distinguish in the formation of human language two great periods. The first period is when men, having hardly had any notions, have expressed only sensations. We will call it "the period of the language of sensations". The second is that in which men began to express analytically these notions by articulated sounds. We will call it "the period of language training", the ancient substance of language, the expression of sensations, preserved largely by tradition. It was absorbed by a new, richer and more elevated language, which became an articulated expression of notions.

1.3. Vowels

The vowel-system of Sanskrit is the most antique in its style. Next to it stands Gothic followed immediately by Latin, while Greek has degenerated most of all from the primitive IE vowel-system. Mr Dwight states, "Both philology and history agree in representing *a* to be the great fundamental primordial vowel, of which the others are but successive weakenings. The vowel *a* was sometimes changed into *i* in Sanskrit through the influence of the vowel *y* associated with it, or because of its being weakened by the loss of its original accent. A striking example of the change of an original *a* into each of the weaker vowel-sounds, in the other classical languages, occurs in the Sanskrit ordinal *saptamas*, "the seventh", and in Latin by *septimus*; where the same vowel *a* appears variously, as *e*, *i*, and *u*. Similar variations also appear in the Sanskrit *madhyas*, and Latin *medius*".

The line *a, e, i* represents the gradual raising of the tongue from the low to the high position; the line *a, o, u* represents the successive stages from the unrounded to the fully rounded vowel. These five sounds of course only represent the most clearly marked vowel positions. The number of intermediate stages between these positions is infinite, because the positions which the tongue may assume are infinite; a limited but still a large number can be distinguished by the ear. Thus, we might have *a, a_1, a_2, a_3, …. o_2, o_1, o*, etc.



Some phoneticians distinguish a few intermediate grades by such symbols as a^e, e^a, etc., the larger letter indicating that the sound approximates more to *a* or *e* and so on as the case may be. *ö* is a rounded vowel like *o* with the tongue position of *e*. It is found in such words as the French *pen* and the German *schön*; *ü* bears a somewhat

similar relation to *u* and *i*. It appears in the French *lune*, the German *über*. In Attic Greek *v* and the vowel represented in Latin by *i* or *u* indifferently, as in *optimus* or *optumus*, were sounds of the same character.

As to the speech producing, the vowel *ö* (pronounced *eu*), and not *a*, is the first sound emitted by a child when he/she wants to express his unconscious, vague, and indeterminate sensations. Also the child, not yet able to pronounce another exclamatory, uses the vowel *ö* to express all sensations, needs and desires. Later, when his vocal organ is developed and formed, the child begins to designate desires and needs he/she feels by the exclamation of *è* and *a*! Finally, the child manages to pronounce *o* and *ou*.

As primitive men as well as children expressed nothing but sensations, the consonants did not yet express relations of place, actions or notions. The labial consonants had no special or natural meaning. They were used by preference because of the facility with which they were pronounced, and they indicated the most diverse things. Such exclamatory words were borrowed from the vocabulary of children's language: *papa!* or *bábá!* (father!, grandfather!); *bäb!* (porridge!); *bäbä!* (dirt!); *bobo!* (pain!). In these words, there is not yet a necessary relation between labials or exclamatory words. In this first period, the period of the language of sensations, there has not existed a natural and necessary relationship between sounds of labial consonants and sensations, desires and needs they intended to express.

The consonants whose sound or pronunciation is fuller, more material than vowels, determine particular meaning of a theme. Vowels have a more general and abstract meaning; they serve to indicate logical relations expressed by consonants. If in a primitive theme or word we change a consonant, we change the meaning of the word. On the contrary, if we change vowels, the meaning remains the same. It undergoes only some formal modification with respect to time, or mode, or the active or passive state.

There are roots and verbs composed only of vowels, for example, in Sanskrit, the root *i* (go), and, in Latin, the verb *ire*. The Sanskrit root *i* has lost its guttural consonant, and its present form is derived from *ga* (go), *ya* or *hi*. The form of the Latin verb *ire* also derives from "hire", as well as *amare* from "hamare" (Skr. *kâmaya*). It is the same with the Chinese words *a, e, o, œ, ui*, etc., whose primitive themes or forms are still found in some dialects and which were *ya, ne, gœ, yu*, etc. In the first period of language formation, the vowels had not formed yet. They served for the pronunciation of voiceless consonants, accompanying them.

In the second period, the vowels moved apart and took a special meaning. The primitive vowel *e* (ö) doubled and gave development to other vowels. Vocalism reached its apogee from the moment when the three vowels *a, i*, and *ou* were phonetically formed by antithesis. Later tongues grasped all vowels, and vocalism returned to its beginning when the vowels *a, i, ou*, by means of *è, é*, and *ö*, approached again the primitive vowel *e*. Thus, as well as in the primitive languages, *a, i*, and *ou* were derived from *e* (ö) via *è, é, o*; the vowels, *a, i, ou* tried again to approach *e* or *ö* by means of the same vowels. We will speak here of the meaning of vowels *a, i*, and *ou*

because they express most clearly their antithetical meanings. All the other vowels are connected with one of these three vowels.

The vowel *a* is opposed by its meaning to *i* and *ou*; and these latter ones are in their turn opposed to each other as to the sense, so that *i* forms a contrast with *ou*, as well as *a* with *i* and *ou*. The vowel *ou* is the most mute and expresses a deep, hidden sensation; the vowel *i*, on the contrary, is the most acute and marks an interior sensation, lively and penetrating. Although the meanings of *ou* and *i* differ from each other, these two vowels express rather a state than an action. They are opposed to the vowel *a*, which designates an external sensation, expansive and mobile.

If we analyze the interjections used in the oldest languages, we will find that *ou* and the vowels, derived from it, express a deep passion, pain, fear, or horror; *i* and its derivatives mark a passion, like the inner joy; *a* and its derivatives express much less a passive sensation than an absence of inner passion.

The vowel *ou* accompanies the particles of place, which designate not the interior but the bottom, or the hidden side, opposite the outer side: Skr. *upa* (near, below); Lat. *sub* (sub); Skr. *ut* (movement from the bottom to the outside); Goth. *us* (from within).

The vowel *i* accompanies the particles of place or cases of names designating the interior. This is why the locative, in Sanskrit, is expressed by *i*: ex. *pitari* (in the father). In Arabic, *i* at the end of a word expresses the dative or the indirect regime: ex. *bi'lmalki* (in the king); *li'lmalki* (to the king).

The vowel *a*, on the contrary, accompanies the particles which designate the outside. Thus, the Latin particle *in* designates the direction from here to there inwards; on the contrary, the Sanskrit particle *ana* designates the direction from here to there, along an object, to the outside.

The role played by vowels in designating times and modes, active and passive, belongs to the particular grammar of languages dealing with forms of words, rather than with the primitive formation of themes. We will only say that the vowels *i* and *ou*, designating something interior, invisible, or metaphysical, express the passive. The active, on the contrary, is expressed by the vowel *a*, which designates what is external, visible, what acts. Thus, the themes *tana* (to extend), *braka* (to break), *spaka* (to perceive), *bara* (to lift), etc., with the radical vowel *a* express the directly active meaning of the verb. On the other hand, the themes with the radical vowel *i* or *u* express either a state resulting from the assumption, as in neutral verbs, or the passive sense derived from the still active meaning of the verbs of the first formation.

Thus, *bifa* (Skr. *vip*, Gk. *febomai*) has the form which gives it the passive sense of "being struck", "agitated", derived from the originally active sense of "trembling"; the Latin *paveo*, on the other hand, is connected with an active form *pav-* (to strike, Gk. *païô*). *Viga* (to be in motion, to be agitated), Skr. *vidj*, Goth. *vigan* have a passive meaning, while *vaga* (to move), Skr. *vadj*, Lat. *veho* have kept the old active form with the radical vowel *a*. The theme with the radical vowel *ou* has a passive meaning, for example, *GuDa* (to be suitable), while *GaDa* has the active form meaning "to join", "to agree".

The short vowel existed in the themes prior to the corresponding long vowel. What proves it is the history of the grammatical derivation of words which make us see that the long vowel is always placed in a word that expresses a more derivative or specialized notion than the corresponding word whose radical vowel is short: ex.: Lat. *regs* (king, pl. *râga-s*), grammatical derivative of *raga* (arise, protrude). It is true that in the origin the difference between long and short vowels did not exist. The primitive vowel *e* was, properly speaking, neither long nor short. When the difference is established, the long and the short vowels, being correlative, must have appeared simultaneously.

It follows that a theme has its primitive form only when it contains shot radical vowels. That is why, among the Sanskrit roots such as *vêp, bhî, gâ, gai*, etc., whose radical vowel is long or diphthong, some are not primitive but derived themes. The others do not have the grammatical form they should have. The prosodic quantity of vowels does not change the logical meaning of words.

1.4. Diphthongs

The diphthong is a combination of two simple vowels distinctly pronounced in a single emission of voice or in a single syllable. There are only *aï* (a-ï) and *aou* (a-ou) which are true diphthongs; the languages whose vocalism is the perfect like the literary Sanskrit and the literary Arabic, know only these two pure diphthongs. As the diphthongs *aï* and *aou* are nothing else than the long vowels *î* and *oû*, they have no other meaning than that of those long vowels from which they are euphonically derived. The diphthong *aî* is derived from *î* or *îî* through the intermediates *éi, èi, äi*; ex. Anglo-Sax. *mîn* (mine) changed in pronunciation to [méin], [mèïn], and later to English [maïne]. The diphthong *aou* derived from *oû* by the intermediate pronunciations of *o-ou, ö-ou, é-ou, ä-ou* finally changed to *a-ou*; ex. Anglo-Sax. *pund* (Lat. *pondus*) is pronounced [pö-ound], [pé-ound], [pä-ound], and [pa-ound].

Hindu grammarians call *gouna* (reinforcement) the vowels composed of *ai* and *au*, and *verddhi* (increase) the vowels *âï* and *âu*. The first is merely another way of pronouncing the doublings of the vowels *i* and *ou*, known as *ai* for *i-i*, and *au* for *ou-ou*. The second is a new prolongation or augmentation of these long vowels, namely *âi* and *â-ou*.

The reinforcement is used not only in Sanskrit but also in many other languages to indicate the grammatical derivation of a word as to the substance in form. Increasing is found in Sanskrit in some rare cases; it is the strengthening of the *gouna* to designate a new grammatical derivation of a word already reinforced phonetically and logically. Thus, in primitive Sanskrit *div-s* (Gk. *dif-s*, Lat. *diu*) meant “sky” (brilliant). Grammatical derivative of *div-s* is originally long, so as to form, *divas* changed to *daivas* (pronounced [daïvas]). This form of “daïvas” has in turn changed in pronunciation to [daivas], which had the meaning of “heaven” or “God” (Lat. *daivus*, *deivus* changed to *dues*; Gk. *daifos*, *deifos*, *deihos*, changed to *dheos* and *theos*).

Then, to say “divine” (from “heaven” or “God’), the Sanskrit grammarians indicated this new derivation by further reinforcing of the long vowel in *daïvas*.

The combinations, which are not diphthongs (the concretives), have a signification or value of derivation, and do not enter into the grammatical composition of words. They owe their origin to the intrusion of a vowel to be placed next to the radical vowel for different causes. As a language moves away from the state of its perfect grammatical formation, many diphthongs change into simple vowels, and many simple vowels are replaced by concretives. Thus, in French, the diphthongs of the Latin language have become simple vowels (Lat. *paucus*, Fr. *pöc*, pronounced [*peu*]); and simple vowels have become the concretives (Lat. *locus*, Fr. *lieu*, Lat. *focus*, Fr. *feu*).

The concretives have no grammatical meaning as diphthongs and vowels *a, i, ou*. They are simply the result of a need for euphony or a more convenient pronunciation of the oral organ. Insertions beside radical vowels are very frequent in Celtic languages. So, we find in Irish words like *cuaird, maoil, fliuch, siuir, liaigh*, etc. It is often difficult to indicate, at first glance, what is the radical vowel of the word; however, it would be wrong to believe that all written vowels are pronounced separately. The spelling often uses, as in French, two or three conglomerate vowels to express a single vowel (Fr. *eau*, pronounced [ô]). The Semitic languages do not generally suffer from concretives or euphonic vowels placed next to the radical vowels. Only in Hebrew, it happens that a liquide enters the radical vowel and the guttural consonant; ex. *ré^{a}g, héri^{a}kh, lou^{a}kh*. This *a*, which the grammarians have called *a furtive*, disappears as soon as the guttural consonant is followed by a vowel; so that one says *réghi, loukhi*, etc.

From diphthongs, one must distinguish *glides* or transition-sounds created while the organs of speech are passing from one position to another. For the most part these transition-sounds receive no representation in writing, inasmuch as the particular glide is practically inevitable, or implied in the situation. Mr Tucker demonstrates “an obvious case when in the Italian *due* it is unavoidable that in passing from the *u* to *e* there should be created a light *w*-sound. We might in fact write *du^{w}e* or *du^{v}e.* To write *duu̯e* itself would be an error, inasmuch as that method would suggest a pronunciation with too protracted transition (sometimes, it is true, actually heard in Italy), *duwe,* in which the *w* is as decisively articulated as the *d, u,* or *e.* The glides belong, however, to consonants as well as vowels. In *due* there is a glide from *d* to *u* and in *kūī* from *k* to *u.* Between consonants, as well as between vowels, there may be developed a new and distinct element in the word, demanding representation in the spelling. The French *tenre* becomes *tendre,* the Latin *emtus* becomes *emptus,* the modern French *oui – oil,* pronounced with the glide *o^{u}il*”.

1.5. Consonants

The framework of the consonantal system of all the IE languages consists of three great divisions, represented by the three leading sounds *p, k*, and *t*; that is, labials or lip-sounds, gutturals or throat-sounds, and linguals or tongue-sounds, of

which last the lightest and most flexible is *t*. Each of these separate orders of consonants has other cognate sounds that constitute a class with it, thus:

	GREEK	LATIN
P	*β* and *φ*	*b, f*, and *ph*
K	*γ* and *χ*	*g* and *ch*
T	*δ* and *ϑ*	*d* and *th*

Each of these classes is subdivided, in the order in which they here stand, into smooth, middle, and rough mutes. They had also, in early Greek, and have more or less now, in various languages, a breathing appropriately belonging to each class. This was with the labials the digamma *F*; with the linguals, *σ*; and with the gutturals, the rough breathing, our *h*. With the linguals coalesce also *l, n, r*; and with the labials *m*.

Different classes of consonants have an elective affinity, as is quite manifest in Latin, for different classes of vowels: as the gutturals for *a* (ah); the linguals and the sibilant for *ī* (Eng. *e*); and the labials for *o* and *u*. The continental vowel-sound *e* (the long flat Eng. *a*, as in *plate*) is medial between the guttural *a* (ah) and lingual *ī* (Eng. *e*, long); as is *o* between the guttural *a* and labial *u*. The consonants may be thefore grouped:

	GREEK	LATIN
Palatals	*κ, γ, χ*	*c, g, ch*
Dentals	*δ, τ, ϑ, λ, ν, ρ, σ*	*d, t, th, 1, n, r, s*
Labials	*β, π, φ, μ*	*b, p, f, ph, m*

Of the three great classes of consonantal sounds, the linguals are the most light and flexible, and the gutturals are the most hard and heavy; so that the labials are intermediate between them both. The *k*-sounds occupy the highest point in reference to its sound consonantal scale for force; and the *t*- and *p*-sounds may be viewed as successive reductions of vocal force. It has been already stated that the consonantal elements of words form the groundwork of language and the vowel-sounds its superficial coloring.

The full classification of consonantal system gives Mr Sweet:

	j	*r,l*	*s, (z)*	*w*
k, g	*c, ʒ*	*t, d*	*p, b*	
kh, gh	*ch*$_y$ *ʒh*	*thy dh*	*ph, bh*	
	(η)	*(ñ)*	*n*	*m*

“of which those in ( ) were only secondary developments, *η* for instance being only a modification of *n* before *k* and the other back consonants. The aspirates in the third line constitute a characteristic feature of Aryan, especially the voice aspirates *gh*, etc. The breath aspirates were no doubt the same in Aryan as they still are in the tradi-

tional pronunciation of Sanskrit, that is simply ordinary English (k), etc., uttered with independent stress on the breath-glide that follows the stop, exactly as in the Irish pronunciation of such a word as *tell*".

Mr Sweet continues, "The voice-aspirates differ in the present pronunciation of Sanskrit from simple *g*, etc., in having strong stress on the glide to the following vowel as in *dadhāmi* "I place" compared with *dadami* "I give", but the Sanskrit grammarians seem to make *dh*, etc., a combination of *d*, etc., with a voice throat-sound, which also occurred alone in Sanskrit as a weakening of *gh*, as in *hanta* "he kills" (present participle *ghnant*); it is called sonant *h* by European scholars. It is, therefore, uncertain whether the Aryan aspirates were originally emphatic forms of *k, g,* etc., or contractions of simple *k*, *g*, etc., and a following throat consonant *h,* which was voiced after voice consonants. Besides the normal back consonants *k*, *kh, g, gh* there were four other back consonants which probably differed from them in being formed as far back as possible in the mouth, like the Arabic *qāf,* developing afterwards into *kw*, etc., in which the *w* may be taken to imply only a rounding or lip-modification of the preceding consonant, not a combination of *k*, etc. + *w*.

The vowel-like consonants *r, l*, *n* and the other nasals were capable of assuming syllabic functions – that is of being used like vowels. This syllabic use of *r* and *l* is preserved in Old Sanskrit, as in the participles *krtá* "made", *klptá* "arranged" compared with *kárōmi* "I make," *kálpāmi* "I arrange", in both of which latter *a* = Aryan *e.* In the present pronunciation of Sanskrit they are made into *r, l* + a vowel, *krta* becoming *krita,* as in the word *Sanskrit* itself. In the other Aryan languages they are resolved in the same way into the corresponding consonant preceded or followed by a vowel, the consonant itself being then sometimes dropped, as is also the case in the Sanskrit representative of syllabic *n*".

1.5.1. Palatals

The Indo-Germanic palatals have nothing to do with the Sanskrit palatals. These latter are original velar gutturals palatalized on account of a following *i* or *e*. But the original IG palatals have suffered a change in Sanskrit. They have become spirants and affricates. Sanskrit palatal class as a whole is a newcomer. It is the old velar or guttural class, labialized or not labialized, before palatal vowels *i, e* and the semivowel *y*. This is the palatal law. Mr Giles considers the main aspects of it as follows:

"(i) IG. *ǩ* = Skr. *ç* (Zend *s*), Gk. *κ*, Lat. *c*, Kelt. *c*, Eng. *h*, medially under certain conditions *g*, Letto-Slav. *sz* in Lithuanian (pronounced *sh*), *s* in Lettic and Slavonic. It will be observed that while Greek, Latin and Keltic keep the hard *k*-sound (which is represented in English by *h* according to the regular change under Grimm's Law), the Iranian and Letto-Slavonic languages change it to some form of *s*. In consequence, these languages throw valuable light upon the nature of the *k*-sound in other languages where *ǩ, ğ, ğh* and *q, g, gh* have been fused together and are represented by the same symbol, as is the case occasionally in Greek, frequently in Latin, and always in Irish. The Italic dialects however and those branches of the Keltic languages which

represent original velars by labials also help us to ascertain the nature of the original gutturals. It is customary to represent a guttural, the nature of which (owing to the lack of cognates in other dialects) it has been found impossible to determine, by the ordinary guttural symbols *k, g, gh* without any distinguishing mark.

(ii) IG. *ǧ* = Skr. *j* (Zend *z*), Gk. *γ*, Lat. *g*, Kelt. *g*, Eng. *k*, Letto-Slav. *ž* (in Lith.), *z* (in Lettic and Slavonic). As Skr. *j* represents not only *ǧ* but also *g* before original palatal vowels, the Zend and Letto-Slavonic show best the nature of any *g*-sound.

(iii) IG. *ǧh* = Skr. *h* (Zend *z*); Gk. *χ*; Lat. initially *h* and perhaps *f*, medially *k* and *g* (when following *n*) or lost altogether; Kelt. *g*; Eng. *g, y* (later); Letto-Slav. *ž* (in Lith.), *z* (in Lettic and Slavonic). From this it will be seen that in Zend, Keltic, Germanic and Letto-Slavonic there is no longer any distinction kept up between the original aspirated and unaspirated voiced sounds".

1.5.2. Dentals

The consonants of this class express direct designation. They therefore mean what we express by the word *this*. That is why the dentals are used to form demonstrative pronouns and articles: ex. Skr. *râdjas* (king-this; the king here present; the king I have in view); Gk. *lukos* (this wolf); Lat. *lupus* (this wolf); Arab. *sâ* (this); Heb. *sèh* (this); Skr. *sas* (this one); *tam* (acc. this one).

The class of the dentals also forms adverbs of time derived from those of place: ex. Skr. *tada* (in time); Gk. *tote* (then); Lat. *tunc* (then); Goth. *thà* (then); Old-Allem. *da* (then); Arab. *ids*, *idsan* (then); Heb. *àd*, *às* (then).

As the person whom we speak to is the closest object we can designate, the dentals also serve to mark the second person singular and plural. Ex. Arab. *anta* (you); *antum* (you); *koumta* (you were standing); Heb. *attah* (you); *àttèm* (to you); *qatalta* (you killed); *q'taltem* (you killed); Skr. *tvam* (you); *dadâsi* (you give); *baratha* (you're wearing); Gk. *tu*, *su* (you); *histès* (you place); Lat. *tu* (you), etc.

The demonstrative particle *ta* indicates the time spent and weak verbs: ex. Skr. *uktas* (here is who is said); *patitas* (here fell); Gk. *lektos* (said); Lat. *factus* (done); Goth. *aljiths* (fed); *aljida* (I fed); Old-Allem. *neritêr* (preserved); Goth. *mahta* (I could), etc. As the reflected meaning of verbs derives from their passive meaning, the particle *ta* which expresses the passive can also express the reflexive pronoun: ex. Heb. *hit'makker* (to be sold); *hit'qaddesch* (to be sanctified); Arab. *taqattala* (to torment to trouble); *taqâtala* (to hit each other), etc.

We still have to consider the dentals in relation to their meaning, or in relation to the notion of movement and direction. The consonants of this class express, in this case, the direction of an object towards a specified point. Since this point may be more or less close to or different from the speaker, the dentals also refer to up-down direction: ex. Skr. *ati* (verses); *ut* (outside); Gk. *és* (towards); Lat. *ad* (vers); *ut* (to, so that).

Any movement towards a designated point may be considered as a distance and a separation, or as a junction and a connection. That is why the dental suffix *-t, -d*,

which indicates the direction towards, also indicates separation or ablative in the old Indo-Germanic languages. The genitive expressing a more metaphysical separation is derived from the ablative whose meaning is more material. That is why *s*, which characterizes this case in Indo-Germanic languages, is nothing but the assibilated *t* derived from *at* (de), or *us* (de) from the old ablative.

The notion of separation, of removal, is expressed by the dentals in the following particles: Lat. *de*; Goth. *dis*; Old-Allem. *ziar*, *zeir*, *zer*. On the contrary, the notion of junction appears in the dentals in the Latin conjunction *et* (and).

The gutturals differ from dentals by designating of objects not in an absolute but relative manner: ex. Lat. *cis* (this side, opposite to the other side, below); *ecce* (see it on that side); Skr. *aham* (me); Gk. *ego* for *egom*; Lat. *ego* (egon); Heb. *anôki* (me). Demonstrative pronouns formed of guttural always have a more relative meaning than indicative pronouns formed of dentals; ex. Lat. *hic, hæc, hoc* (what it is about) are less indicative and more relative than *is, id*. As the notion of disjunction naturally implies that of relation between two terms, the gutturals, which express this relation, also form disjunctive particles: ex. Anglo-Sax. *gë-gë*; Allem. *yé-yé*.

The demonstrative particle *ta* designates objects absolutely while the guttural particle *ka* designates objects relatively. The indication by the guttural particle is not absolute, precise, or affirmative. This is why gutturals form both relative and interrogative pronouns: ex. Lat. *quis* (who?); Goth. *hvas* (who?); Allem. *hver* (who?).

The gutturals designate the motion considered as junction or disjunction. Thus in Gothic, the prepositive particle *g'a-* (Old-Allem. *ka-, ki-*, Lat. *con-*) expresses the notion of junction, and in Greek the preposition *ek* expresses that of disjunction or output. The Gothic prefix-particle *ga-* is usually found in words whose meaning implies the notion of union, alliance, ex. *galeiks* (suitable, similar), etc.

In summary, the dentals have two main meanings from which all the others derive; one directly designates the objects, the other indicates the direction from here to there.

1.5.3. Labials

When the oral organ has become more developed and formed, the pronunciation or articulation of consonants begins to occur in the language of children and primitive men. The most easily expressed consonants are the labials. In the origin, the homoorganic consonants belonging to the same organ were not differentiated in the pronunciation either as a hard consonant *p*, or as a soft consonant *b* and *m*, or as an aspirated consonant *v* and *f*. They pronounced themselves as intermediate consonants between *p* and *b*, *v* and *f*. Later, when the vocal organ was better exercised and formed, each of the labial homogenic consonants was pronounced more clearly as *p*, *b*, *m*, *v*, and *f*.

The labial expresses the ratio of place designated by the word *on*, by the notion of *spread on* and *surface*. Ex.: Heb. *be*, Arab. *bi* (on, near, in); Gk. *épi* (on, from); Skr. *upa* (on, from) Gk. *hupo* (under, to); Lat. *sub* (under), Goth. *bi* (over, to). The

notion *on* considered under the active point of view or combined with the notion of movement produces the notion of spreading, or being plane.

In Sanskrit, *va* means "air", "water" (which spreads); Heb. *maï* (water); the notion of plan is more apparent in Sanskrit *ap* (water, see Lat. *aqua*, Allem. *eben*). The Sanskrit words *va, iva, eva* also mean "equal", "similar", "as well as", "too". In the Semitic languages, the word *va* has become conjunctive prefix *and, likewise*: Arab. *va* (and); Ethiop. *va* (and); Heb. *ve, va* (and); in Latin, it has become a disjunctive particle enclitic: ex. *plus-ve, si-ve*, etc. The notion of spreading, moving away concerns the meaning of the following prepositions: Skr. *ava* (derivative); *apa* (separated); Gk. *apo* (distant); Lat. *ab*; Old-Allem. *ap*, Allem. *ab*.

In Indo-Germanic languages, *mi* and *mas* designate the first person (this individual) of the singular and the plural; ex. Lat. *sum* (this individual is here). In some cases, *m* has changed to *n*: Skr. *nas* (ours); Lat. *nos* (we). In some other cases, *m* changed to *v*: Goth. *veis* (we); Skr. *vam* (to both of us).

The old *me* has been preserved in the participles and some Semitic nouns with the meaning of "a person" or "a thing"; ex. *maq'tulu* (who is killed), Heb. *mal'koakh* (who is taken, booty). This *m* corresponds exactly to the ending *ma* in Indo-Germanic words; ex. Skr. *sama* (same person or thing); Skr. *bhama* (shining thing, sun). In the Semitic languages, the form *me* (which, object, person) has become an interrogative pronoun: Heb. *mi* (who?); *mah* (what?).

1.5.4. Liquid L and Nasal N

The consonants *r* and *l* had the same meaning. Originally, the letter *r* was not liquid but strongly guttural. This *r* became gradually softer and more liquid than the sound *l*. The pronunciation of *r* being originally explosive expresses the notion of eruption, exit, and projection; ex. Gk. *ari-; éri-* (very); *aristos* (the most eminent). In the active sense, *ra* means "to project"; ex. Skr. *ri* (advance); *aryas* (eminent, honored), etc.

The liquid *l* indicates the notion of momentum, length, distance. The *l* has formed, in a large number of languages, diminutives; ex. Lat. *lupulus* (cub); Goth. *vulfilas* (cub); Allem. *Gretel* (small Marguerite), etc. The meaning of remoteness makes *l*, combined with a demonstrative particle, to produce the notion that we express by the word *there* (which is distant); ex. Heb. *hal* (here, the); *ellèh* (them); Lat. *illud* (this); *alius* (the farthest, the other); *ultra* (on the far side, beyond); Gk. *altos* (the other), etc.

The nasal *n* has, as for the pronunciation, a lot of affinity with the nasal labial *m*. Also in the languages, these consonants often take the place of one another, and, in the Phoenician alphabet, they are placed next to each other. As for the signification, *n* differs from *m* and approaches the liquid *l*. In fact, *n* and *l* designate the notion of distance. Thus in Sanskrit, we say *anyas* (the other), in Latin *alter* (the other). *n* (the other, that one) means the accusative or the direct regime, as opposed to *s* (the latter),

which designates the nominative; ex. Gk. *lukon* (the wolf). This *n* has changed into *m* in Sanskrit and Latin.

The notion of remoteness produces that of negation. Negation is also expressed sometimes by *l*, sometimes by *n*; but most often and most energetically by this last consonant; ex. Heb. *al, lô* (no); Gk. *an-* (non); *nè-* (non).

1.6. Thematic Words

We have just seen what the special natural meaning of the different organic consonants is. These consonants are the elements which, combined in different ways, produce the themes. These themes form the framework or the body of words disregarding their endings and any purely euphonic or grammatical change. The simplest themes contain only one consonant. In this first class are the themes from which the words designate the relations of place and time. The active or participative themes deserve to be fixed before the abstract particles, later derived from these themes (see works by Mr Bergmann and Mr Terrien Poncel):

(i) The labial *pe* (sur) signifies "to be on", "cover", "protect"; ex. Skr. *pa* (to protect); *gôpa* (cow protector, cowherd); *pater* (protector, father);

(ii) The dental *ta* (here! behold!) means "to place", "to deposit"; ex. Skr. *dha* (place); Gk. *tithèmi* (put here, there!); Lat. *dare* (there, hold on!); Gk. *didomi* (to give);

(iii) The guttural *ga* (together) means "to unite", "to join"; ex. Skr. *yu* (attach); *ga* (go to, join); *ya* (go); Gk. *kiô* (go); Lat. *ire* (go).

The consonantal themes are relatively small in languages because the actions they designated could rarely express themselves sufficiently, by a single gesture, movement, or by a consonant expressing this movement:

(i) The labial *pe* (on), combined or composed with the guttural *ke* (junction movement), produces the bissyllabic theme *PaKa*, which means "to move", "to join", "to reach", "to take"; ex. Skr. *paç* (grab, take); Zend *paç* (join, link); Goth. *fahan* (take, grab); Allem. *fangen* (grasping).

(ii) The guttural *ke* (junction movement), composed with the labial *pe* (on), produces the theme *KaPa* (movement toward or over), which means "tending toward", "reaching", "taking"; ex. Lat. *capio* (holding out his hand); Goth. *giban* (give, extending the hand); Lat. *habeo* (take, support); Goth. *hafia* (hold, support).

(iii) The dental *ta* (here), composed with the liquid *na* (there), produces the theme *TaNa* (movement from here-there), which means "tender", "to extend"; ex. Skr. *tan* (expand); Gk. *teino* (extend); Allem. *denen* (tender); Lat. *teneo* (take, hold). The dental *ta* (here), composed with the liquid *la* (there), produces the theme *TaLa* (movement from here-there), which means "to reach", "to spread"; ex. Skr. *tal* (to reach); Gk. *tellô* (spread); Old-Allem. *zîlen* (to reach, to win).

(iv) The liquid *la* (there), composed with the dental *ta* (here), produces the theme *LaTa* (movement of there, here), which means "to let go", "to leave behind"; ex. Goth. *lêtan* (let); Old-Allem. *lazus* (relaxed); Lat. *lassus* (released), etc.

There are still other two consonantal themes formed from the same process: *ra* (eruption) + *ga* (movement) = *RaGa* (eruptive movement), ascending (Allem. *ragen*), be eminent, brilliant (Skr. *radj*); *va* (Lat. *ab*) + *ga* (movement) = *VaGa* (movement); *na* (là) + *pa* (sur, vers) = *NaPa* (to be salient).

1.7. Primitive Roots (I)

We agree today that the primitive words of all the IE languages were monosyllabic. It is true that the constitution of the Hebrew roots and of the Semitic languages in general seems to contradict the doctrine that we defend. These roots usually contain three consonants and are made up of two syllables; but it is not very difficult to prove that one of these two syllables, sometimes the first, more often the second, is of a more recent origin, and that it only specializes the vague meaning of the radical syllable. We reproduce them here:

1. A very large number of roots containing the three consonants evidently contain only two ones, since sometimes the third is only the second repeated, and other times the third letter was obtained only by adding an *aleph*, a *yod* or a *vav*, in the middle or at the end of the root, or by having it preceded by the noun consonant. It is so in *yâtab* and *tôb* which means "to be good"; *nâphahh* and *poûahh* – "to blow"; etc.

2. There are series of roots which have in common only the first two consonants and whose meaning is almost the same, although they differ by the third. Thus the verbs *la'ab, la'at*; *la'am, la'aph; la'ats*, *la'ak* have in different dialects the meaning of licking and swallowing; *gaba', gaban, gabahh, gabab*, the meaning of raising and vaulting; etc. There is no doubt that these observations are applicable to all the primitive words of the Semitic languages.

It has long been believed that the roots of the Malay, the Tagalog, the tongue and the idiom of New Zealand were mainly bissyllables. Mr Humboldt has shown by the analysis of a multitude of examples that here again the bissyllables could be reduced to monosyllabic roots. The same primitive monosyllabism is also distinguished in the Coptic and in other African idioms.

The later stages of IE languages became in all cases more and more analytical. Flexional terminations are replaced by prepositions, auxiliary verbs, and other help-words. Of three original numbers (singular, dual, and plural) belonging to the noun, pronoun, and verb, the dual is rejected. Mr Tucker supposes, "The primitive IE roots have no independent existence apart from stem-forming or word-forming suffixes. A person-ending or a case-ending may be found attached directly to the root without the intervention of a stem-forming element, as in **es-mi* (I am), but a simple *es* has no place in speech proper. Usually the root is built into a stem or base by some element or elements out of a numerous list (*-o-, -e-, -r(o)-*, etc.) and thereto may be attached further elements one upon another, until the various relations of the complete word (in point of case, number, person, mood, tense, etc.) are fully expressed".

Vowel-variation of the root was a regular phenomenon of the primitive IE, but had originally none of the effect upon meaning or function which was exercised by

the much more extensive and systematic vowel-mutation in Semitic. Thus in IE, the root **bher* might also appear as *bhor, bhr*, and *bhr-*; the root **es* as *s*; the root **sem* as *som, sm, sṃ*; the root **ei* as *i* or *oi*. But these divergences were apparently brought about only by differences in the position of the main and secondary accents of a completed word, and by a consequent modification of the enunciation given to its "root" portion. They in no way served to express causative, intensive, or similar modifications of meaning, nor to mark off verbs from nouns, nor (originally, at all events) to distinguish tenses. There is accordingly not the same reason as in Semitic to write a "root" with consonants only, but it is convenient to give as the root that grade of vowel which would occur when the chief tonic accent fell upon it.

By a "root" Mr Papillon suggests "the simplest combination of sounds which expresses the general meaning of any word or set of kindred words, e.g. *da* is the root of Sanskrit *da-dā-mi, da-mus, da-tur*, etc., Sanskrit *dā-tar*, etc. The formative elements, suffixes and inflexions, which form words from simple roots, are originally independent roots. Thus in *da-da-mi*, "mi" is a weakened form of "ma" – the pronominal element of first person; in *vox* (voc-s), Sanskrit *vāk* (= vāk-s), *s = sa* (demonstrative pronoun). Thus, every IE word is a whole gradually sprung from several, or at least two, "roots" The first of these is the "root" in the ordinary acceptation of the term, i.e. that which conveys the meaning in general; the others have degenerated into suffixes for expressing modifications of meaning".

In the "isolating" or "radical" stage of language, the roots remain separate and distinct: *i*-ma. In agglutinative languages, the principal root remains the same, but receives an addition in the form of a changeable prefix, suffix, or infix *i*-ma or *i*-mi. The inflectional, or highest type of language, alters the principal root (by reduplication) for purposes of expression *aimi* (Sanskrit *emi*).

IE roots are generally monosyllabic and determined by Mr Taylor as

1. Primary, e.g. *i* (go), *ad* (eat), *da* (give), *yu* (join).

2. Secondary, e.g. *tud* (strike), *yug* (jug, yoke), *yudh* (fight), *plu* (flow), *ard* (hurt).

These secondary roots are probably in all cases (as evidently *yug, yudh*) modifications of primary roots, by the addition of a letter or letters, expressing usually some extension or limitation of the idea. The additional element may have been in some cases "dynamic", in others "phonetic" – i.e. a mere change of sound, afterwards turned to account for the expression of meaning, as e.g. the phonetic variation of the α-sound into *a, e, o*.

The primary roots are the most important in the history of language, but their predicative power being generally too indefinite to answer the purpose of advancing thought, they were largely encroached upon and supplanted by secondary roots.

Philologists are not agreed upon the exact definition of a "root". Professor Max Müller defines a root as "whatever cannot be reduced to a simpler or more original form". At the same time, he seems to maintain the real force of roots – e.g. "that the root *da*, in some way or other which we cannot yet explain, has some necessary connection with the idea of giving". It is, however, strange to find the same root not only used for different notions, but actually applied to things which are essentially contra-

dictory. Mr Farrar refers to "Chinese *louan* which means both "to make a disturbance", and "to govern well"; *ton* is both "to poison" and "to nourish"; *kon* is both a "worm-eaten vessel", and "to mend a vessel". In Greek the prefix *ἀ* is sometimes negative, sometimes copulative or perhaps intensive; and in German the inseparable prepositions *ent-* and *ver-* sometimes express negation and sometimes not. The explanation of the phenomenon is to be found in the Law of Association of ideas, and the harmony of the apparent discord is generally discoverable in the history of the word itself".

Prof. Max Müller in his "Elements of Language" divides Sanskrit roots into predicative and demonstrative. He states that "roots are necessarily monosyllabic with 1st one vowel sound only; or V + consonant, or C + V; 2nd, C +V+ C; or 3rd, with three or four consonants and vowels. The first is the most important in primitive language but naturally gives too limited and indefinite a power for the purposes of ever advancing thought".

Fick's investigations showed that "the secondary roots derived from the primary; these we find formed, 1st, only from simple vowels (a, i, u), 2ndly, from the vowel *a* + a consonant (ad, ap, as, etc.), 3rdly, from a consonant (simple or double) + the vowel *a* (da, dā, etc.)". The determinatives have been divided by Mr Fick into two classes. The first does not alter the sense of the roots, while the second gives rise to the secondary roots, distinct in meaning from the primary roots from which they spring. The determinatives of the first class are *a, n, m*. The *a* we find, e.g., in the secondary Proto-Aryan roots *gna* (to know) from *gan*; *ja* (to go) from *i*; the *n* in the primitive *gan* from *ga* (to beget); the *m* in *gam* from *ga* (to go), etc. The determinatives of the second class are more numerous (see works by Mr Pezzi) :

1st, Determinative *k* (e.g. *vak* [to speak] from *va* = *u* [to utter sound], *dak* [to bite]).

2nd, Determinative *g* (e.g. in *ug* = *vag* [Lat. *augere, vigere*] from *u* = *va* [to be content], *jug* from *ju* [to join]).

3rd, Determinative *gh* (*argh* [to move violently] from *ar* [to excite], etc.).

4th, Determinative *t* (kart [to cut] from *kar* = *skar* [to shave], etc.).

5th, Determinative *d* (*kad* [to fall, to yield] from *ka* [to go], etc.): this *d* seems to Mr Fick to be derived from the root *da* [to give, to make] .

6th, Determinative *dh* in roots of the fundamental Aryan *kudh* [to hide, to guard] from *sku* [to cover], etc.): *dh* goes back to *dha* [to make].

7th, Determinative p (*kap* = *skap* [to make hollow] from *ska*, with a like meaning, etc.): this *p* is closely connected with the root *op* (pa) [to make] (whence *ap-as, op-us*).

8th, Determinative *b*: this exists only apparently, because the roots in which we find it are either parallel forms of roots, in *bh* or *v*, or formed with reduplication.

9th, Determinative *bh* (*gharbh* [to grasp] from *ghar* [to take], etc.).

10th, Determinative *s* (e.g. *uks, vaks* [crescere] from *ug* [augere]).

Very soon, Mr Saussure admitted primitive IE roots of more than one syllable. As far as IE is concerned, it was characterized by a wealth of morphological forms, by long and complex words. There are many savage languages accumulating morphological parts in single words with meanings, which are relevant in certain specific

cases and useless in others. The examples may be arranged in the following three categories:

I. Variations of meaning in roots identical in sound

We have a root *kar,* "making" (Lat. *creare*), another root *kar*, "mingling", and a third root *kar,* "cutting" (Lat. *cernere*). Or in Old Chinese, there were homonyms like *tik*, "to throw", and *tik*, a "joint", which may both be referred to a root *t-k.*

II. Variations of meaning in different words derived from the same root, or from different roots identical in meaning

The root *da* = "bind", which occurs in the Gk. *deô*, is referred by Mr Geiger to an older form, *dja.* With this is closely connected the root *dam* – "tame", whence, in this signification, Lat. *domare*, *dominus*, etc. The primary signification was doubtless "bind", "join", etc., whence Gk. *demas*, "body", "frame", *demôs*, "community", "people"; *damar*, "wife"; *demô*, "build", and *domos*, "house"; Lat. *domus.*

III. Variations of meaning in the same word (as distinguished from a root)

This variation arises from failure to invent a new word for the varying conception: *bell = tintinnabulum*, and the German *bellen* – "to bark"; Eng. *dumb*= "mute"; Germ. *dumm* – "stupid", etc.

1.8. Primitive Roots (II)

As comparisons show, in the PIE language names, pronouns and verbs formed paradigms and were realized in the speech in the form of various grammatical forms. Immutable there were only adverbs, also carried out the functions of prepositions and particles, used as unions.

The grammatical forms of the changed words differed at the endings, alternations of vowels and in some cases – in the place of stress. The forms of personal pronouns were suppletive, i.e. they were different roots, performing the functions of forms of the same word, because they had the same lexical meaning and different grammatical. The main indicator of grammatical forms was the endings. In many names and verbs, the stem was divided into root and suffix. The functions of suffixes in names and verbs were different, and in this regard, different nature had the meaning of the roots. In such a name, the root expressed only general idea underlying the meaning of the word; with the help of the suffix, this idea was limited, concretized and turned into a certain meaning. In verbs, suffixes served not only as a means of word formation, but also as signs of some grammatical categories (present tense, conjunctive, optative). Therefore, the verb root itself denoted a certain action or state (and not just a general idea), and the suffix introduced an additional meaning of the process or modality. In names, the root was distinguished by associations between different names or names and verbs, in which this part is common. In verbs, it was a result of associations between different forms. There were also many names and verbs whose basis consisted of the root alone; their root had full lexical meaning. Words with prefixes in PIE did not exist.

The stem and the ending were clearly distinguished by their functions. The stem expressed the lexical meaning of the word. It often happened that the same root in some cases was combined with suffixes being an integral part of the stem, in others it was the whole stem and had a full lexical meaning. This root, of course, in combination with the suffix treated as a special part of the word with its meaning.

The root of the usual word could be only one. But in the PIE, at least at its last stage, there were complex words consisting of two stems. There could be more than one suffix. The ending in any word, including difficult, was only one.

Phonetic Structure of Roots

All PIE roots reconstructed by comparative grammar are monosyllabic. Therefore, each of them has one syllable-forming phoneme. However, the latter in some cases could not really be pronounced, but from the morphological point of view, this phoneme can be considered absent and zero. The fact is that the main syllable phoneme in the PIE was the vowel *e*, but it alternated with *o* and with zero vowel. If after or in front of this vowel there was a sonant in the root, then at the zero stage, i.e. at the loss of a vowel, the sonant became syllable-forming. E.g. from Greek verb *λείπω* "leave" aorist – *ἔλιπον*; root – *λειπ-* | *λιπ-*, i.e. at loss of *e* syllabic phoneme becomes *i*.

It is necessary to clarify the monosyllabic nature of the IE roots. In some roots monosyllabic is secondary. It has long been noticed that the roots ending in a long vowel, as shown by the alternation, used to be two-syllable. So, the root **plē-* (Lat. *plenus*, Gk. *πίμπλημι*), ascending to **pleh-*, alternates with **pelh-, *pel-, *pol-* (Skr. *parī-man* "abundance", Goth. *fil-u* "many", Gk. *πολ-ύ-ς* "many"), which means that there was a vowel between *p* and *l* before. Therefore, once it had the form **peleh-* and were dissyllabic.

Mr Meillet drew attention that such an alternation is in some roots not related to the two-syllable, for example, **u̯elu* | *u̯leu, *regc-* | *prek-*. He explained that in the composition of these roots there are "dead" suffixes (in his terminology – "determinants"), in which there was an alternation of *e* || *zero*; accordingly a similar alternation occurred in the root itself, i.e. **pr-ek* | *per-k*. Thus, Mr Meillet did not extend to these roots the name "bisyllable". But with the same reason, it can be argued that the roots, called "bisyllable", contain "determinants". The root we have taken as an example is attested in varieties reflecting **pelh-, *pleh-* and **pel-*, from which we can conclude that it consists of the original root **pel-* and "determinative" **-eh*. This problem was later resolved by Mr Benveniste.

The Structure of Suffixes and Endings

The phonetic structure of suffixes in reconstructed IE words and forms is less regulated than the structure of roots. The suffix may consist of a consonant and a vowel, e.g. the suffix of verbal adjectives in **-to, *-no* (Skr. *bhug-nah* "bent"); it may also consist of a vowel sonant and a syllabic vowel, e.g., **-io* (Skr. *acviyah* "horse", Gk. *ἵππιος*); of a vowel and a consonant; a vowel of syllabic sonant and a vowel; two consonants and a vowel; a consonant, a vowel and a consonant; and consonants instead of vowels can consist of a vowel and two consonants, e.g., the participle suffix is **-ont* (-**sont*).

Every suffix is attached to a certain kind of root (with respect to stress and vocalization). So, suffixes **-men* and **-os* are combined with stressed roots. In suffixes there is an alternation *e* || *o* | *zero*. The endings do not have phonetic constraints.

As we have seen, there are contradictory phenomena in the structure of the reconstructed IE roots. With the usual monosyllabic IE roots, some of them still recognize the bisyllabism. All this required a historical explanation and encouraged Indo-Europeans to go deeper into the analysis of the roots in search of their original structure. Because of many studies, there has been a solution to the main issues.

First, it should be noted that not all reconstructed roots are primordial, indivisible morphemes. In some of them, further analysis highlights some other constituent elements. Many of the elements included in the composition of roots are unknown. Probably, at that stage of the IE language, which is restored by comparative grammar, they had no meaning. Obviously, this is "dead" suffixes. They differ from real suffixes not only in the loss of values, but also in the absence of vowels in their composition. We do not distinguish them as special morphemes, but in the study of the history of the IE root, they are separated in the first place.

Mr Benveniste explained that the so-called "two-syllable" roots consist of more ancient monosyllabic roots and "dead" suffixes. So, in the root **pleh-* he allocates the root **pl-* and the suffix **-eh*, and in the variety of the same root **pelh-* | **pel-* and **-h* respectively. Both in the root and in the suffix the vowel *e* alternates with zero. A similar composition with the same alternation Mr Benveniste found in many roots that are not summed up under the category of "two-syllable".

Thus, in the comparative grammar of IE languages there were two concepts of roots: the original root and the later, which included the "dead" suffixes. Many began to use the term "root" in the sense of the original root, and therefore to refer to the root, which may be "dead" and for suffixes many began to use the term "stem". This term was created by Mr Hirt, who considered the main feature of the stem vowel the alternation with zero. Later, some linguists (e.g. Mr Brugmann) used this term in the purely phonetic sense, as a designation of a part of a word in which the alternation occurs. Mr Prokosh believed that the stem is a syllable in which the vowel alternates.

It is noteworthy that in the examples collected by Mr Benveniste, and then by other linguists, the original root always ends by a sonant (**per-k-* | **pr-ek, *u̯er-g* | **u̯r-eg-, *pel-h* | **pl-eh*, etc.). In one example, **pet-r-* (Skr. *patra-*) | **pt-er-* (Gk. *πτερόν*), the root ends by a simple consonant, but the suffix contains a sonant. Mr Benveniste passed by this fact.

Based upon the "laryngeal" theory, Mr Benveniste discovered that a number of roots, which are considered to be original, in fact contain a suffix with full disclosure and the root – with zero. Mr Benveniste comes from the "laringal" theory in the version developed by Mr Kurylovicz, who claims three laryngals. According to this concept, in the PIE there was one vowel phoneme *e*, and *a* and *o*, not alternating with *e*, were formed from *e* under the influence of various laryngal consonants: short *a*, *o* arose after laryngals, long ones – in front of them, in connection with their disappearance; words beginning with a vowel had an anterior laryngal before. This concept has led Mr Benveniste to the conclusion that the original roots have not only ended by the

non-syllabic phonemes, but started with non-syllabic ones. Thus, it turned out that the original IE root always consisted of two non-syllabic phonemes, between which there was a syllabic *-e*. Many of them received extensions in the form of suffixes and distributions, but some remained in their original form, for example,**sek*- "follow", **tep*- "warm", **bher*- "carry", **ten*- "pull".

It is unknown whether every root began with non-syllabic phoneme: this question must answer the "laringal" theory. But it is very likely that every root originally ended with one non-syllabic morpheme, before which there was a syllabic one – always a vowel; in the beginning there could also be a non-syllabic morpheme, but only one.

Mr Kurylovicz developed a slightly different theory of the IE root, but his theory deals with a substantially different issue, since the term "root" he used not in the conventional sense. Usually, the root is understood in the synchronic plan as a part of a word that contains the main element of lexical meaning (or lexical meaning in its entirety), in the diachronic plan – as the initial part of a word. And Mr Kurylovicz defines the root as a part of a word that has a certain phonetic composition: at the beginning – a consonant or a combination of two consonants, then – a vowel, at the end – again a consonant or a combination of a sonant and a consonant. The number of consonants also included the disappeared "laryngeals". The root by this understanding has some functional sense, because the reconstructed IE reproached roots (along with ancient suffixes allocated by Mr Benveniste), taking into account the "laryngeal" theory, have characteristics of such a phonetic structure, but not overlap with it. By such a purely phonetic definition of the root, it turns out that pronouns do not have roots, because their roots **me, *te, *u̯e, *so, *to*, etc., do not correspond to the definition proposed by Mr Kurylovicz. In this definition, there is no question about the distribution or the oldest suffixes included in the root.

For our consideration, it is important that Mr Kurylovicz divided the IE roots into "lights", i.e. ending with one consonant (e.g. **hes-, *rivers-, *ten-*) and "heavy", i.e. ending with a sonant and a consonant (e.g. **bheid-, *leuk*, *perk-, *genh-*). Within vowel alternation, this distinction is essential. Mr Kurylovicz, like other researchers, believed that the allocated root is a result of the weakening of vowels in unstressed syllables. Initially, in his opinion, each consonant was followed by a vowel, but by a new weakening of vowels, depending on the place of stress, the vowel disappeared either after the first consonant or after the second; and from the roots such variants as **hes*- and **hse-, *perk*- and **prek*- have been formed. Later, a second weakening of unstressed vowels resulted in "heavy" roots, so that **leuk-, *perk*- reduced up to **luk-, *pṛk*.

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CHAPTER TWO
RISE OF PRIMITIVE LANGUAGES

2.1. Of Primitive Man

In Western literature, especially in that which deals with Levy-Bruhl's works, it is mostly presupposed that primitive man does not merely associate mystic powers with the various things. "Thing" and "powers" still constitute an undifferentiated whole. "The distinction between them marks an advanced stage in cultural development", suggests Mr Werkmeister. He continues, "Since primitive man knows no phenomena apart from magic influences, our scientific "explanations" are meaningless to him. He freely "communicates" with "spirits" and "souls" and with "totem animals"; and the objects of his dreams are as real to him as are the things of the "external" world. Actually, his contact with things is itself a "communication" with intangible and invisible "powers," with "spirits" and "souls". Experimental tests, therefore, decide nothing". Thus, primitive man requires no "proof" or "experimental verification" for his opinions.

We but insist that the world-view of primitive man is the result of an integration of experience – just as our world-view is such a result. Mr Werkmeister is right that "primitive man uses concepts not at all like ours. We try to speak with logical precision; primitive man tries to depict. We classify, he individualizes. His concepts are predominantly image-concepts. His languages show an almost total absence of generic terms corresponding to general ideas, while they abound in terms designating specific persons, animals, plants, and things". The Tasmanians, to cite only one example by Mr Werkmeister, "had no word for tree in general, but they did have words for every variety of gum tree or bush. Even more characteristically, they had no words to denote such qualities as *round, short, tall, hot, cold, soft, hard*, and so on. The meaning of "round" they expressed by saying, "like a ball"; that of "hard" by saying, "like a stone"; that of "tall" by saying, "big legs"; and so forth".

In Western literature, we also find that "the type of sentence in the languages of primitive tribes is suited to the description of specific events, and this differs from European languages in two important aspects. First, there is no copula in them, the subject is not reified; the predicate is not an "essence", inherent in the subject. Here then we find thought to be still descriptive, direct, and concrete-situational, and still not tending to reveal the more profound, constant, and necessary characteristics of objects. Second, in the sentences that express activity, usually it is not man who acts and causes action: movement and action are inherent in the object itself: man is merely brought into a relation with it. This is the case, for example, in the grammar of the Navaho".

But let us see below this problem under other circumstances, for example, from the works of Russian Linguistic School, namely from Mr Katsnelson's works.

2.2. Levi-Bruhl's Criticism

Mr Levi-Bruhl and his followers consider primitive thinking as a kingdom of mysticism and fantastic representations, impenetrable for what we call experience. It is ridiculous to deny that fantastic elements such as mythology, magic, etc., took much place in consciousness of primitive people. But whichever there was a specific weight of these irrational elements in primitive consciousness, they do not possess a predominating role when determining the major features of this stage of thought development. Thought in any epoch is a process of reflection of reality, its reproduction with various degree of accuracy. To understand it means to find relationship of this thinking towards reality. If at the same time it turns out that in consciousness of this epoch there is a lot of perversion, the researcher is obliged to discover what parties in rational consciousness of this epoch were so insufficient that the possibility of destructive thought occurred.

Grasping a separate thing or a concept is not a simple, direct act, the possibility of transformation of an abstract concept into the idea of imagination. Otherwise, even the simplest generalization ("table" in general) would be a piece of imagination.

Thus, to understand primitive consciousness, it is necessary to refer not to foolish statements of savages, not to illusory elements in primitive ideology, but to objective and fruitful sides of positive thought. The problem of such research is to search for a rational kernel of primitive ideology and at the same time to establish in what limits the primitive thought kept the objective value, to reveal all boundaries of rational thought of the savages.

In primitive languages, it is possible to notice that the limitation of a primitive thought is shown in such elementary logical sphere as the field of relationship of objects and their qualities. Since the childhood we are trained in languages in which necessary categories are developed and we do not have trouble in that area where in primitive languages similar categories are absent. From grammatical viewpoint, this feature is available in the uniform of undifferentiated figurative name replacing in such languages both nouns and adjectives.

By considering language materials of Aranta, it is easy to notice that *inta* means "stone" and at the same time "lying", *alkira* –"sky" and "clear", "blue', *ipita* – "hole" and "deep", and in certain cases "high" (Lat. *altus*), etc. Lexical unity of subject and quality designations penetrates all the systems of a name in Aranta.

But in practice Australians-Aranta do not grope the way in the dark of "absolute identity" when all objects seem to be equal. Opposite to that, it is easy to be convinced that in objects of surrounding reality they mark out the thinnest nuances of qualities and have very rich and developed dictionary for designation of objects which differ from each other sometimes only in insignificant and hardly noticeable signs. On the other hand, there are no bases, however, to ignore differences in structure of words to identify categories of such language with the corresponding categories in languages of the latest stages. Though a number of cases in such languages (general speech context, external situation) allows us to guess what part of a name – subjective or qualitative – is available, primitive languages continue to remain unlike

the modern languages. The difficulty of analysis of primitive speech in many respects is that the word meaning is a historically developing category.

In naive psychology of sensualism, the idea of color, taste, smell, form, softness and hardness, warmth and cold is considered as the simplest categories of consciousness and is identified with feelings. The father of modern psychology Mr Locke claimed, "Cold and hardness which a person feels touching a piece of ice is the same separate ideas in soul like a smell and whiteness of a lily or taste of sugar and smell of a rose. For the person nothing can separate perceptions from such simple ideas".

We do not find in languages of primitive formation that "separateness" of qualitative value about which Mr Locke spoke. Qualitative values always refer to various connotations. This feature of primitive name, which can be designated as "qualitative polysemantism", found Russian linguist Mr Potebnya. In Aranta, *taltja* means not only "gray", "green', but also "soft", "elastic" or "unripe", "inedible". In such combination of different forms, there is nothing supernatural and mystical. Various qualitative values are here in interrelation as different qualitative aspects of one subject.

An interesting example of qualitative polysemantism from one language of South Australia (Adelaide) is given by Mr Elkin. The word *turla* is used in the meaning "huge", "serious" and "angry", "fight". For the native "to become big", "to increase in sizes" and "to fight" are close concepts. The image of a snake rising above the ground to bite is the cornerstone of semantic connotation.

The qualitative polysemantism of a primitive name is often used by different values of the same word belonging to one field of sensory perception, say, to the field of color perceptions. So, *ulpa* "red and yellow ochre" as a qualitative word means "friable" and in the field of color values can designate both "red" and "yellow". Coincidence of values is explained not by "syncretism of sensory perception" but by unity of a subject basement of these different qualities.

Ethnographers noted that in primitive languages there are no names as "tree", "fish", "bird", etc., and that instead of such generalized words there is a rich number of expressions for concrete kinds of trees, fishes, birds, etc. Comparing the words of primitive language with ours, we often find that many designations correspond to one word.

Based upon the facts of such a kind, Western researchers conclude that primitive man tried to speak generally while we speak individualized. This conclusion is obviously wrong. In reality, primitive people also classify objects though they classify the other way than we do. So far we investigate such language from the point of view of what in it corresponds to the uniform word of our language, the research will remain incomplete. One needs to undertake the reverse observation. It is necessary to look what in our languages corresponds to the uniform word of archaic language. By this checking, it would turn out that one primitive word corresponds to many words of a modern language, i.e. that phenomenon "subjective polysemantism" could be applied to our languages, too. Thus, the indistinct and expressionless primitive word does not hold anything mystical and irrational. Mysticism in thinking and behavior of primitive people begin merely when natural boundaries of analogy disappear. But in Western works – one example is Baldwin's "Genetic Theory of Reality" – the expla-

nation of primitive thought goes further than that of Soviet linguistics which we touched above:

"(I) In the first place, primitive thought does not recognise the logical principle of "excluded middle". Primitive negation does not proceed by logical exclusion, but by positive and active social rejection. The classes established in this way, not being logically exclusive, may overlap one classes, may be excluded at one time and not at another, may escape altogether the "either-or" of logical disjunction.

(2) There is no logical contradiction in the thought of primitive peoples. They do not feel the need of rejecting a thing because they have accepted its opposite.

(3) Things are to the savage identical, which seem to us absolutely different and contradictory. Even numerical difference may constitute identity. The class is a matter of emotional and preferential value; potency of harm, or of good, or of social utility, or of tribal advantage; such are the lines of distinction. The class is teleological, not logical. There is the lack of logical inference and argumentation".

2.3. Language Evolution (I)

By primitive language, we do not mean the mode of expression used by first peoples, or a specific language of our globe, such as Hebrew, Sanskrit, or Egyptian. By primitive language, we mean the rudimentary state of all the languages in their primordial epoch in which the different groups of peoples intended to speak them.

As we have previously noted, in the beginnings of human speech monosyllabism was almost interjectional. It is monosyllabism in all the idioms. The background of the Sanskrit language, as an example, consists of about 2000 of these monosyllables, called "roots" by the grammarians. These roots are not abstract beings, created by the imagination of linguists; they were real, true words, as it is proved by the Vedas, which contain many of them. What characterizes the roots is that they do not belong, by their external form, to any of the categories of the discourse; that they are verbs, nouns, and even adverbs. The language of the ancient Egyptians gives us more than one example of phrases formed by means of these root-words, to which the order in which they follow each other gives a precise meaning and value.

Mr Humboldt has rediscovered monosyllabism in the Malay, Basque and Mexican languages. Only the Semitic languages do not seem to fit into the general law. And yet one merely takes a glance at a Hebrew dictionary he/she at once discovers hundreds of monosyllables. It is true that most of the verbal roots contain three consonants, but a very large number of them effortlessly return to the monosyllabic form. Who would deny that *nadah, nadad* are elongated forms of *noud* (flee); *dahha, dahhah, dahhahh*, of *douhh* (hit)?; that the monosyllables *doush* (to beat the wheat), *tzouk* (to pour), *kout* (to feel disgust), *souk* (to yield), etc., are older than *adash, nakat, yatzak, nasak*? Often also the third consonant introduces a new nuance into the more general meaning of the monosyllabic root, without there being any doubt as to the relationship between it and the derived roots.

We do not pretend to find the thread that connects all the dissyllabic roots to primitive monosyllables, although we were aware that such enterprise was attempted. The success of this endeavour could not be expected to be decisive, given the fragmentary state in which the Semitic idioms, especially the oldest of all, the Hebrew, are interwoven. Let us limit ourselves to saying that the primitive monosyllabism of Semitic languages is today considered as a fact acquired in science, although there are different methods to explain it. What may have caused some doubts for a long time is the fact that the second syllable of the dissyllabic roots has an irreducible element, that it is never a new root, but a sound taken arbitrarily to develop later the meaning of the first syllable. This method of proceeding does not belong exclusively to the Semitic languages. In the case of IE, it is enough to cite forms such as *dico* and *δείχ-νυ-μι, αξω* and *αξάνω, εξχω* and *εξάδω*. Much has been written about the value of the formative syllables *-νυ-, -αϑ-, -αν-* and others; but it will not have come to anyone's mind to consider them as independent words.

The foregoing considerations may have given the doctrine of monosyllabism a certain degree of plausibility; and this plausibility would amount almost to certainty if there were languages in which the monosyllabic character had been maintained up to the present day. Now these languages exist; the most famous and the most elusive of all is Chinese.

Chinese is a monosyllabic language, but has it always been so? In recent times, attempts have been made to cast doubt on the character of constant fixity, despite some changes in detail, which Chinese grammar and words have retained throughout the centuries.

Moreover, Chinese writing, despite the many transformations it has undergone, is a most striking proof of the monosyllabic character of all the words of the language. What proves victoriously that Chinese has always been monosyllabic is that it contains no trace of an earlier synthesis. All the modern languages which, to our knowledge, have reached their analytic period, keep some remains of their more complex old grammatical system. The inflected forms of German are numerous and very difficult to learn; French, Italian and Spanish have inherited some of the synthetic forms of Latin.

In fact, the Chinese language, being deprived of all means of derivation and even of real composition, had it earlier by the use of particles preceding or according to the terms indicating the ratios. Originally, the other languages had to proceed in the same way; but little by little, they combined with the full words of the sentence those particles, which served as a sort of adjunct to the discourse, while the Chinese retained all their independence. This class of words, which Chinese grammar calls empty words, and whose number rises to several hundred. But there were much less of them in the beginning, and then they were of a less frequent use. In order not to get lost in the words, which almost all can be name, verb and particle, the Chinese recognizes as a sovereign law of the sentence a fixed and invariable word order. A similar law had to be observed at the beginning of things in almost every language of the globe. How, for example, would Sanskrit, Greek and Latin have succeeded in possessing such a regular system of conjugations and declinations, if at the origin of

things the Aryas had not followed the full word, the main word by its determinant; that is to say the verbal notion of the suffix indicating the pronoun in the singular, in the dual, in the plural; the notion of the substance of the suffix marking the genre, the number, and especially the case?

Suppose, for a moment, that the place of these particles-suffixes was variable, never the primitive populations would have thought to combine them with the words to which their thought related irresistibly, and never the Japhetic idioms would have been flexing languages. In our modern languages derived from Greek, Latin and Sanskrit, the flexion is mutilated or disappeared completely; the words follow each other according to a certain order. But since these words have retained part of the synthetic baggage of ancient times, they are less subservient to this order than the Chinese words, whose value and meaning are only recognized by the place that they occupy. Thus, the Chinese language, as a primitive language, can be identified with three characters: 1. the multiplicity of terms to express the same idea, 2. the elasticity and vagueness of the meaning attached to the same term, 3. many and entirely different senses attributed to the same sound.

This multiplicity is surprising in a language, which contains only 450 monosyllables, or better, something like 1200 sounds, each of which can be pronounced with several accents. One might suppose that the Chinese language, spoken by a very intelligent people, uses with caution the limited resources that such a vocabulary can offer. That is not the case. Chinese, not knowing the flexion, has amount of periphrastic expressions.

To express the plural they use up to thirteen different articles, such as *muèn* (several), *tèm* (the others), *moei* (each), *chùng* (all), etc. The genitive and the datif can be designated by six prepositions; the comparative uses *king* (much more), *yeu* (more), or the verbs *kuò* (surpass) and *pì* (compare); the future – *ciang* (prepare), *hoei* (prepare), *yao* (want), etc. This abundance of terms for designing identical ideas or relationships extends even to the pronoun, since there are several terms in use for saying *me, you, him* or *that one*. It is an indication of a rudimentary language seeking its way to a clear and precise expression. It is certain that, if the flective signs could have been combined in an intimate way with the words to which they relate, their number would necessarily have diminished; the language instinctively recognized cases, numbers, participles, modes of verbs, etc.

We have now arrived at several notions of a rudimentary kind with regard to the primeval language. First, primeval language was monosyllabic, and its syllabary, though containing no double consonants, had probably consonant finals. Second, certain roots, verbal and pronominal, are so widely spread among the various linguistic families of Europe and Asia, that a large portion of the primeval vocabulary may be expected to reveal itself as the reward of careful research. Third, the order of words in sentences was that of nominative and verb, verb and object, adjective and substantive, subject and predicate, species and genus. The common laws of position in the primeval language probably agreed with those of the Chinese, Greek, English, and some other languages in such sentences as “John see William”, “good man”, “this man is good”, or “this man good”. When two or more verbs occurred, the order was that of

time. Fourth, the primeval language had probably a rudimentary tonic pronunciation. Variety in tones, inflexions, pauses, accents, long and short quantity, belongs more or less to all the tongues spoken.

To show how a primeval language system might look like, we refer to the prominent works by Mr Hovelacque, Mr Katre, Mr Ghatage, Mr Sayce, etc., from which we extract good examples of the Ariyan speech development. (I) The common Aryan speech possessed the three vowels *a, i, u*, with their corresponding long sounds, *ā, ī, ū*. (II) The Aryan consonantal system was simple, consisting of the three explosives *k, t, p*, of their corresponding softs *g, d, b*, and of the aspirates g^h, d^h, b^h. Besides these the two nasals *n, m*, one dental, the other labial, the liquid *r*, the dental sibilant *s*, and a *v*, uttered doubtless as is our *v*. The liquid *l* was unknown to the common Aryan speech. (III) The Aryan declension included the three genders – masculine, feminine, and neuter; the three numbers – singular, dual, and plural; and eight cases. The Aryan verb has two voices, one transitive – "I hear"; the other intransitive – "I hear myself"; both, however, being active.

The comparative philology of Aryan speech was really created by the comparative grammar of Mr Bopp. When the grammatical relationship of the IE languages had been established, there was a solid basis for phonology to work upon, and it was not long before Mr Grimm discovered the laws, which regulate their interchanges of sound.

2.4. Language Evolution (II)

The starting point of any grammatical expression is certainly the root, and we mean by it the one that expresses the object or action, not the one based on the expression of relations or grammatical categories. In the first direction, it is a pure, isolated root. One can easily use simple roots, even rudimentarily, where there is no obligatory order between them. One can speak, even then, with much clarity. This system is well observed in Chinese where it is the order that decides whether a particular noun is a subject or an object, or whether it is an indirect complement to a noun or verb. In the second direction, the root is no longer isolated: between it and the next one, a third degenerated root is established, whose only function is to mark the relations. It is the system of expressing relations and grammatical concepts in empty words. In the third direction, the root remains isolated, but no longer immobile, it varies, grows, decreases, changes internally, it even goes to the point of changing completely, finally it projects out of itself one of its elements that will settle on another word. Thus, it acts alone, as in the first direction, but no longer by the respective order, this time by transformations, by its own vitality.

Syntactic System

We shall call the first system "the system of syntactic order"; the second "the system of empty words"; the third "the system of radical variations". The evolution that we are going to observe has a particular thing that after a long circuit seems to return to its starting point. We will also see by a more careful observation that the re-

turn does not manage to coincide with the point of departure. There is a true circle in the sense of this movement, but not a closed circle.

The first stage of this system is the state of isolation. The roots have no contact with each other and seem to avoid it; no phonetic changes occur. In general, the root is monosyllabic, but this is not necessary, it could be, and it is actually also polysyllabic.

In the second stage, the roots approach each other without any of them becoming an empty word; there are pronouns that join the verb or the noun; the order always remains obligatory, but the entire sentence manages to make only one word. One may however separate each root graphically, by means of dashes, phonically by slowing down the pronunciation. It is the system of incorporeal or polysynthetic languages. One of the achievements of this state is the objective conjugation.

In the third stage, the roots thus joined in an increasingly extended conglomerate end up melting together, first by their initial or final phoneme which changes or even disappears. Moreover, each word, as in Eskimo, ends up losing an entire syllable. The union is intimate and deviating by a phonetic process of syncope. At other times, the process remains morphological. Finally, it is no longer the pronouns alone, but also the nouns that are agglutinated to the verb, or that are placed inside the root.

The syntactic order is sometimes direct, i.e. according to the formula: 1. subject, 2. subject complement, 3. verb, 4. direct addition of the verb, 5. indirect addition of the verb; sometimes inverse, following the above formula, but reversed; sometimes enveloping, following the formula: 1. complement of the subject, 2. subject, 3. indirect complement of the verb, 4. direct complement to the verb, 5. verb. But this distinction relates to the psychological part of language, not to its morphological state. The order can be marked on the nouns and be objective, or be marked on the pronouns and be subjective, but this still concerns the psychological part of the language that we examine below.

Finally, the root, isolated or not but expressing relations by its order alone can contain the clear idea of a noun or a verb or metaoperator between various parts of discourse. This distinguishes between formal and non-formal languages. The syntactic order used as a means of expression of thought determines therefore:

1. The relation between the words; the same word being subject or attribute, direct or indirect, or genitive, depending on its situation,

2. The category of a word among the parts of speech; this word being noun, verb, adjective or adverb, depending on its situation,

3. The meaning of the word itself, expressing a being or a quality.

System of Empty Words

This system is one that dedicates some roots to expressing relationships, while others express ideas of substance (either beings or actions). There is a division of the function. Sometimes the empty word is not completely empty because of its autonomous meaning; it alternately expresses an idea of action or object and an idea of simple relation. This duplication is very common in some languages. Preposition is still half a noun, but it is only a preposition.

The evolution of empty words consists in the alternating operations of condensation. First of all, an empty word (empty of the primitive meaning) remains completely isolated from the full word, whether it is used for it or not. This is the system in effect in most of the languages of Oceania and Africa. Then the empty word gets closer to the full word, there is agglutination: from there, the languages called agglutinating, but it does not act differently on the full word, and the full word does not act on it. At most the consonants accommodate each other; it distinguishes the agglutinating state from the isolated one. On the other hand, the empty agglutinated word loses its accent.

Then the empty word and the full word act on each other; bifurcation occurs in the system. Sometimes it is the full word that acts on the empty word, sometimes it is the empty word that acts on the full word. In the first case, we obtain the phenomenon of vocal harmony. It is the well-known system of the Uralo-Altaic languages. In the second case, it is the empty word that acts on the full word, and the empty words that act on each other, we obtain the phenomenon of flexion.

Flexion is of three degrees. In the first case, the various empty words, combined with the full word, act on each other; this is what happens in the Sanskrit declination where it is impossible to separate the index of numbers, that of the genus and that of the cases, while in the agglutinating languages these different indices are never confused.

In the second case, the empty word modifies the final of the full word, combines with it's a thematic vowel, from which a diversity of conjugations and declensions arises, which, from a practical point of view, makes the flective languages difficult.

In the third case, the vowel of the empty word (exactly the opposite of what happens in vocal harmony) acts on the vowel of the full word, stands next to it, or merges with it (vocal inflection).

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The psychic or syntactic part of the language is that which considers neither the different forms, nor the words as composes of phonemes, but the ideas in their expression. For example, the paradigm of the case flexions of nouns belongs to the morphology; on the contrary, the concept of the different cases and their use belong to syntax.

The idea is, at the starting point of syntax, the isolated one, as in the morphology the isolated root. It is at the same time subjective, it is formed in relation to the person speaking, and not in an absolute way. From this point of view, as far as beings are concerned, it is more pronouninal (personal pronoun) than substantive. Finally, it is material and not intellectual. The first ideas are those of visible objects or actions; the others derive metaphorically from them. These ideas join the others to form a thought or a fraction of a thought. In one of these directions, it is necessary to examine the order of the ideas among themselves. Which one will be expressed; which one will be thought before the other? There are three different orders:

(1) when the determinate comes before the determiner, it is the direct order whose formula is: 1. subject, 2. complement of the subject, 3. verb, 4. complement of the verb, first direct and then indirect;

(2) or it is quite the reverse; the determiner precedes the determinate;

(3) this inverse order leads to the enveloping order in which one intercalates between the subject and the verb all the complements of the verb; in reality this case does not differ from the second, as long as one does not establish an entire union between the words. For then the determinant is always precedes the determinate.

Chronologically, it is the direct order which is the first, then comes the enveloping order, then we return to the free order which had been the first at the time when the idea had not yet taken any direction; finally, the order becomes direct again.

Here we can still follow the process of rarefaction and condensation, because the enveloping order is certainly a condensation. In another direction, the idea can be either subjective, objective, concrete, or abstract. It can be so unrelated to any other idea. This is what we have seen above. But it can use another idea to be subjective, for example, when an article or a predictive pronoun is added to the noun.

2.5. Language Evolution (III)

Just as the root is at the head of the morphology and forms the starting point, just as the idea is the starting point of the syntax, so does the syllable when it comes to phonetics. In linguistics of the last decades, it was predominated that language can be thoroughly described through elementary finite essences which will serve for extracting other entities. This assumption goes so far that even a syllable is possible to describe in phonologic terms. For example, Mr Hjelmslev considered that for creation of general abstract theory the relations between accent and syllable have to be "reversed"; accent and modulation one counts for primary categories, and a syllable as a derivation from accent. Accent in Hjelmslev's system is a finite unit of abstract level – "kenemy" – as well as phoneme.

Mr Trubetskoy assigned all prosodic signs, including syllabication, to one of the types of phonologic oppositions. The syllable was defined by him the same way as by Mr Hjelmslev – as a derivation from abstract phonologic concepts, from a concept of opposition or from a concept of a vowel (but a syllable cannot be a base for the definition of a vowel).

On the other hand, in the last one and a half decades appeared the opposite tendencies – the refusal from finite, discrete and abstract units as a basis of the linguistic description. For example, by comparative reconstruction linguists preferred to use more concrete concept *sound type* instead of *phoneme*. This concept, as we know, is applied in so-called "generative phonology" which operates not "phonemes" but "sound types" characterized in dichotomy relations (vowel, consonant, compact, diffuse, low, sharp, etc.). More attention has been paid for prosodic phenomena. In American linguistic school of the 1940s, this principle found its initial form by Mr Harris. Later it was formulated by Mr Frei. As general phonetic principle, it gained further development in English linguistics by Mr Robins, Mr Palmer, etc. In Soviet linguistics, nondiscrete principle developed as an application to general reconstruc-

tion by Mr Martynov. There existed an intermediate tendency, too: the recognition of such elements as “group-phoneme” or “sillabophoneme”.

In the light of general nondiscrete principle, we consider a syllable as a main concrete anthropophonic unit from a position of a speaking person. The syllables are the minimal units into which it is possible to divide the speech into pauses. The process of syllabication is subordinated to specific laws of each language; even by identical sequence of vowels and consonants it can be in different in languages. It is easy to notice that in our definition the syllable is defined not from within but from outside as a distance between pauses.

This definition corresponds to how factually phonologists act; for example, in Avanesov’s system the syllable-boundary is defined as a scanning pronunciation. Such phenomenon as sharpness (palatalization) or flatness (velyarization or labio-velyarization) undoubtedly belongs to a syllable in general. In the simplest case, they can be shown on an open syllable: *ki* – sharp, *ku* – flat. When in the course of the description of language one passes from a syllable to more abstract discrete units, phonemes, there arise at least three theoretical opportunities. First, flatness (or, respectively, sharpness) is possible to assign both to a vowel and to a consonant, to duplicate it in both phonemes. But none phonologic theory goes this way: the description would become superfluous. Second, if flatness (sharpness) is referred to a consonant, then a vowel will be free both from flatness and from sharpness, remaining the same in both cases. Third, if flatness (sharpness) is referred to a vowel, then a consonant remains unchangeable (see Mr Stepanov’s works).

Table 1

Syllable	**1. Flatness (sharpness) is referred to a consonant**	**2. Flatness (sharpness) is referred to a vowel**
Sharp *ki*	k’ – ĩ	k – i
Flat *ku*	k^{u} – ĩ	k^{u} – ĩu ([ы]) or [и])

Both systems are theoretically possible in modern Russian. Most descriptions of phonemes of Russian are generally given in terms of Moscow Phonologic School. At the same time, as we know, there are also hard and soft (nonpalatalazed and palatalized) consonants; vowels have no correlative oppositions in Russian (*u, э, a, o, y*). The sounds [ы] and [и] are regarded as a type of the same phoneme [и]. This description is based upon the first of the possible ways.

The syllable is certainly at the beginning of language creation, isolated and simple; it consists of a vowel plus a consonant like an open syllable in Chinese. We know well that one can dispute this example, that the Chinese was not always monosyllabic, and that its monosyllabism is of decadence, like that partial of the English and the French, but we think that beyond this historical monosyllabism there is another monosyllabism, primitive one. In fact, it seems to us impossible that man first used several syllables to express a simple idea, except in the case where he wanted to give more strength to his expression by repenting twice identically the same syllable;

this repetition is perhaps even the seed of later dissyllabism. Therefore, the starting point is the single syllable. However, this is only a rule for a few languages. Others began with the syllable followed by a consonant, of the form *pak, pat*; this is what we called practical monosyllabism. There is really only one syllable here, since there is only one voice. But we do not stay at this fixed point and move in several directions.

In the first direction, the order of phonemes in the syllable was varied. From the open one we have gone to the closed syllable, then to the enveloping syllable, that is to say at the same time beginning and ending with a consonant, the intermediate system is rarer than the other two; finally we have returned to the open syllable. This process can be seen historically in the monosyllabic and insulating languages; the syllable was opened, that is certain, but it gradually introduced the habit of closing it by a nasal sound, an aspiration, or a second vowel, finally by any consonant; that is, the initial consonant could fall. It soon became an accumulation of consonants, which seemed almost impossible to pronounce, as in Polish, Czech, and Georgian. In the Romance languages, the finals fell under the force of accent; we return to monosyllabism and at the same time to the open syllable.

In the second direction, from its primitive monosyllabism the word passes to dissyllabism, which is general among languages, then to trisyllabism, for example, in Semitic languages, then finally to polysyllabism without any other formula. From this moment the word becomes too long, the accent is placed on the penultimate or the antepenultimate and its force increases every day; it destroys the syllables that follow it, weakens those that precede it, and soon we return to monosyllabism. The tonic accent is no longer syllable to syllable, but word to word. It is, in fact, the polysyllabism which gives birth to the accent, because the various syllables of the same word cannot be pronounced with the same force, or the word would have no hierarchy, organic unity. Similarly, monosyllabism produces intonations; words would not stand out clearly on each other if they were not separated by a difference in tones.

In the third direction, we observe the various movements of the syllable taken in isolation. This syllable has its growth and decline. It may be in the normal state, in the strengthened or weakened state, or in the reduced state, from the point of view of its consonantism or its vocalism. It is therefore necessary to extend the meaning given to the above words by the Neo-Grammarians. Reinforcement can be done in many ways, not just by the introduction of an *a* or *o* depending on the language. It is also available in Finnish where the syllable is either in the diphthong or in the simple vowel. As for the reduced state, it can occur under the influence of the accent, as well as of other causes.

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CHAPTER THREE
MODELS OF LANGUAGE DEVELOPMENT

3.1. Preliminary Explanations

Language modeling, like technical modeling, has its peculiarities. It represents general scientific method of deduction, mental experiment, or interpretation of a model as an ideal object. Linguistic modeling concerns language as a system of relations between semiotic elements (structural linguistics) or as a process of verbal communication.

Any model is a part of language and thus a hypothetical construction. In philosophical view, mathematical models describe phenomena incomplete, metaphorically leading to the double sense. In 1931, Mr Gödel showed that formalized theory did not cover all true statements in it. The same can be said about the language; full definitions of words *quite, undoubtedly, much, compatibly, truly, more* have a high degree of subjectivity.

We will count linguistic model for true, if one level in it is not contraposed to the other. Such a model was introduced by Russian linguist Yu. Stepanov with whom I cooperated. Of course, his model differs from that of mine. Yet, many approaches coincide, particularly in logic. Below I concern three levels of language – Language-1, Language-2, and Language-3 – as evolutionary process of development Semantics, Syntactics, and Pragmatics; Language-1 and Language-2 consist of words expressing observable qualities, while Language-3 determines egocentric words.

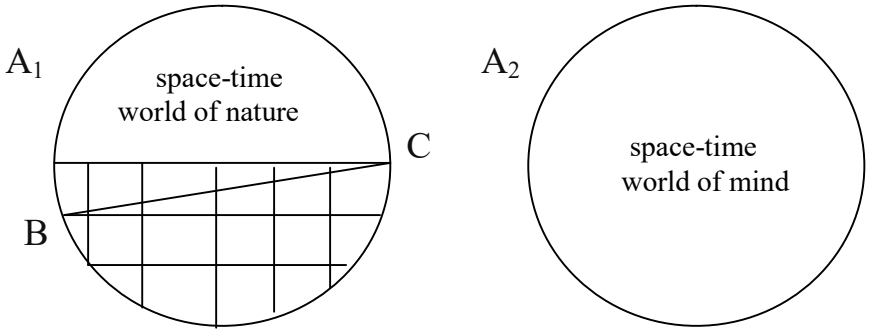
Another Russian linguist A. Yudakin introduced linear model of language. Theoretically, it is similar to morphological classification of languages allowing of grasping philological processes from different backgrounds. Originally, it aimed at the reconstruction of Proto-Finno-Ugric and Caucasian languages. Later it was developed as unified picture of man's thought.

Stepanov's system remains complete, while Yudakin's proposes further investigation. I try to overview these systems as far as it may be presented in this chapter. I also draw attention to information unknown to a wide range of Western linguists. For that purpose, I begin with elucidation of rare Western works contributed to language modeling.

3.2. Evolutionary Model

Language as evolutionary process was described by many. Yet the study of Mr Wilson seems to be one of the most fruitful. No one will deny Wilson's suggestion that "organism constantly goes through the enveloping medium of space and time;

the actual space-time world of material nature, and the ideal space-time world of mind so that the two worlds are coterminous. A duplicate world occurred as soon as the human get a verbal substitute for every object in the world. Thereafter he carries the world round with him by means of this organization".



Mr Wilson illustrates his theory drawing a circle A representing the actual world of nature. The horizontal lines mark the zones of inorganic and organic forms in the world. The vertical lines mark their succession in time. The rising line BC shows the evolutionary time processes. The circle A_2 is the new space-time world of mind just born and entirely empty. The task of a man is to possess this new world of conscious mind, to "intellect" the world, to transfer its types one by one from the outward space-time world of nature to the inner space-time world of mind. Or to restate the situation from the evolution point of view, when the world merges into a new cycle of its rising life, splits into two halves, an outer and an inner, passes from unconscious to conscious activity, and man emerges as the world-born conscious organism to bring to actualization this new cycle of world development.

3.3. Stadial Model

The conception of psychological evolution in relation to the origin of language leads to the stadial theory, which reconstructs the development of communication from its first inception to its full elaboration. If we accept that man has developed gradually out of primitive forms of life, it follows that he must have passed through stages before finally arriving at phonetic language. These stages correspond to the three phases of linguistic evolution.

Mr Révész' theory of linguistic origins is of particular interest for our investigation because it shows all the stages as passing over into the earliest ones without a break. If we add the contact sound to the series of three stages of communication as a preparatory process, we can visualize the evolutionary sequence of phonetic means of contact.

The most primitive form of contact is a sound of the cry and the call building the incomplete imperative language, which later got all the basic language functions. This transitional form concludes the proto-history of language. Mr Révész supposes that "phonetic language gradually becomes more differentiated; vocabulary, grammar and syntax become more complex and expressive. The introduction of the subjunc-

tive and the compound tenses lend language an expressive variety with the finest nuances of meaning".

(i) The first stage of communicative contact appears phonetically in the form of cries related to specific needs, but not yet directed to particular individuals.

(ii) The second stage, the vocative function, represents the very earliest form of the imperative and must be regarded as the transitional form between non-verbal communicative phenomena and the earliest form of language.

(iii) The third stage is the so-called imperative language. The fourth form of linguistic communication already embraces the three principal linguistic functions, but still shows a primitive structure, and does not go beyond concrete representation. The latter two represent the successive stages of linguistic proto-history.

(iv) After these preparatory stages, language begins as the mature symbolic form of communication. Whilst animals are limited exclusively to non-linguistic forms of communication, man makes use of linguistic forms as well.

Comparison of the forms of communication reveals clearly how the purposes and manner of expression vary with the degree of the contact. If we trace back to the origin of humanity, we would notice that at the stage of the Wurm's period, the first human speech (prior to 350,000 B.C.) consisted mainly of primeval rudimentary vocabulary (see works by Mr Orton):

ă = arrival, or come,
pā = foot, or go
ĭ = this,
dūsh = warning call
ūz = water
dām = breath, living creature
jā = living place, lair, or place
dă = that
ădăm = birth, or coming of a child
măk, măka = dry land (Pashtu, zmăkă)

All these roots are in Santali and the allied languages of the most primitive races in India. They are also in Brahui, which is one of the oldest of Dravidian languages. They persist on, into Pashtu, Hindi, Baluchi and Persian. The next progress in speech (up to say, 250,000 B.C.) ended up with more complicated words:

kăta = act, do, put (Brahui, *kăta* = put)
dūsha = enemy (Pashtu *dūshmăn*)
mărăn = big (Santāli = *mărăn*; Baluchi = *măzăn*)
dé (*dy* or *dăy*) = sun, light, or look
pā, pōts = foot
Etc., etc.
dūr = the sun
tā, tār = dark
āl, ăl = wood, timber
wrŭk = loss, lost
pāl = pole, in swamps

3.4. Linear Model

The linear model of language, which predicts the occurrence of grammar categories, was firstly introduced by Russian linguist Prof. Yudakin. After having discussed the advantages of this model with the author, I concluded that it mostly reflects genealogical and morphological classification of languages. First, it embraces the reasons why language got its present-day nature. Second, we see how this language goes through evolutionary modifications. Yudakin's model is not perfect and far from

completeness. Nevertheless, it differs from the previous understanding of language development.

I. Samoyedic and Finno-Ugric languages

Samoyedic languages: Nenets → Enets → Nganasan → Selkup

Ugric languages: Khanty → Mansy → Hungarian

Volga languages: Erzya → Moksha → Komi-Zyrian → Komi-Permyak → Udmurt → Mari

Main processes from left to right are a) the transition from a verbal to the verbal-nominal structure; b) the appearance of personal possessive forms of nouns; c) the subject-objective conjunction (or objectless conjunction); d) the personal indefinite verbal forms as the opposition to the personal conjunction in active voice.

II. Baltic-Finnish languages

Lappish → Veps → Izhora → Finnish → Karelian → Lappish → Votic → Estonian

Main processes from left to right are a) the penetration of copula into participial complex and thus the appearance of analytical forms; b) the substitution of personal forms of nouns by personal pronouns in Genitive; c) the substitution of subject-objective conjunction by nominative structure; d) the transition from indefinite forms of active voice to active-passive forms.

III. Dardish languages

Central part: Khovar → Kalasha → Tirakhi → Pashan → Shumashti → Votapuri → Govar

Ost part: Kashmiri → Pkhaluri → Shina → Garvi → Bashkarik → Kanyavali → Torvali

West part: Kati → Ashkun → Prasun → Vaiyali → Dameli

Main process: the shift of copula

IV. Ibero-Caucasian languages

Abkhaz-Adyghe and Nakhs languages: Abkhaz → Abazin → Chechen → Ingush → Batsbi

Main processes from left to right are a) the development of conjunctive class, the transition from binominal category of “man-thing” to conjunctive class; b) the transition to four-case system of conjunction; c) the appearance of simple sentences instead of one indefinite construction; d) the disappearance of category of possession and the appearance of personal pronouns in Genitive.

V. Avarian and Andi languages

Avarian → Karata → Bagvali → Tindi → Chamali → Godoberi → Andi → Botlikh → Akhvakh

Main processes from left to right are a) the transition from conjunctive class to personal conjunction; b) the synthese of copula and the appearance of Present Sim-

ple; c) the disappearance of Past Simple indicator; d) Gen. of personal pronouns as possessive pronouns.

VI. Tsez languages

Tsez → Khvarshi → Ginukh → Bezhiti → Gunzib → Laki → Dargi

Main processes from left to right are a) the development of conjunctive class; b) the development of secondary synthetical forms of Tenses; c) the suffix derivation of adjectives from other parts of speech; d) the appearance of short forms of adjectives in function of a predicate.

VII. Lezghin and Georgian languages

Budukh → Khinalug → Kryz → Tsakhur → Archi → Rutul → Agul → Lezghin → Tabasaran → Udi → Svan → Zan → Georgian

Main processes from left to right are a) the transition from abstract conjunctive class to personal conjunction; b) the indistinguishability of nominative, ergative and dative cases by personal pronouns; c) the appearance of passive voice.

3.5. Three-Dimensional Model

The three-dimensional model, as I stated in "Preliminary Explanations", was firstly represented by Prof. Stepanov. But the thought that in one natural language there are different types of other languages has been noted yet by Mr Russell in his logical theory of types. Later Mr Hintikka used a similar consideration as one of the bases for the concept of "possible worlds". Proceeding from purely linguistic observations, Mr Stepanov suggests that grammar of a natural language, in particular the Ancient Greek, Russian or English, can be described as a combination of different "layers" or "languages" in one system. Three models given below – Language-1, Language-2 and Language-3 – allow of grasping some important logical concepts, which are traditionally considered in philosophy of language.

"There is nothing more essential than to imagine a language in the form of space or volume, in which people form their ideas", says Mr Stepanov. "In semiotics, language occurs in three dimensions – semantics, syntactics, and pragmatics. Semantics deals with relations of signs to what signs designate, to objects and concepts of reality. Syntactics deals with relations of signs to each other. Pragmatics (deictics) deals with relations of signs towards a person, who speaks this or that language".

3.5.1. Language-1: With Semantics

In Language-1, names and predicates are grouped in one class. The predicates never attach an object, and the verbs are always intransitive: "A Cat is purring". The statement like "A cat licks the paw" is impossible in this language. Neither names, nor predicates can be reduced to a simpler expression. "Cat", "dog", "badger", etc.,

are names in this language. It is impossible to speak about animals in general. The word *animal* is a class name but not a name of a member of a class. The predicates contain designations of properties of objects: “mews”, “barks”, “sits”, “runs”, “sleeps”, “eats”, “beautiful”, “angry”, etc. The properties are objective and do not depend upon one’s opinion or mental experience. Therefore, “beautiful” and “angry” are the same objective properties as “mews” or “eats”.

In Language-1, it is possible to imagine the language in which the objective qualities are expressed in one grammatical category, and the subjective ones in another. Language-1 is an extensional language where names and predicates are the part of a statement. Thus, the essence of predication consists in attributing of a predicate or a name. Two important assumptions result from this.

First, the predication has a direct convincing force. Mr Pearce called it “rational force”. Language-1 allows us to trace back to the appearance of properties. If a class of names corresponds to a class of objects, and a class of predicates corresponds to a class of properties of these objects, then this combination of a predicate with a name contains something already known to the listener.

Second, in Language-1 all propositions are either analytical or synthetic. Both properties and objects exist as independent entities; thus, they are synthetic. At the same time, they are analytical because they have a direct convincing rational force.

In Language-1, there are no logical words *or, some, all, negation*. The talk in this language cannot be about something absent. Of course, there arises a question whether someone can lie in Language-1; the coordinates “I-here-now” are not expressed here. However, in Language-1 the statements about the past are possible. For the distinction between “A dog is shaggy” and “A dog was shaggy” in Language-1 presupposes two expressions: “shaggy_1” and “shaggy_2”. Thus, Language-1 deals with semantics; syntactics is entirely subordinated to semantics, and pragmatics (deictics) is absent at all.

“Can we express the art in such language?”, asks Mr Stepanov. Under some conditions, it would be possible to describe an “epos” as a narration about objects of reality covered by names of this language. But such “epos” would be rather boring; without coordinates “I-here-now”, any “epos” will not differ from common speech.

3.5.2. Language-2: With Semantics and Syntactics

Language-2 is that whose key indicators are characterized by the number 2. The degree 2 means that there are “a subject” and “an object”. “A cat catches a mouse”, “A cat eats a mouse” are typical statements of this language. As predicates are two-placed here, all verbs are transitive. The names are grouped in two classes indicating two sets of objects of reality; one class delivers terms of subjects, another – terms of objects. Thus, the difference of a subject from an object is a semantic sign (at the same time, of course, syntactical sign). A cat has a “property” to catch mice, but a mouse has no “property” to catch cats; a mouse in this language is an object of the second class.

The coordinates “I-here-now” are still absent in Language-2; they appear in Language-3 where among classes of names there is a special class “I”. The compatibility is essential in Language-2, but nothing forbids us to combine the predicates defining the second class of subjects with the subjects of the first class. If in Language-1 “mews” always defines a class of “cats”, then in Language-2 this predicate defines a class of “mewing entities”. The definition “X mews” refers to “mewing objects” which embrace all “cats”.

3.5.3. Language-3: With Semantics, Syntactics and Pragmatics

Language-3 is that whose key indicators are characterized by the number 3 or more. The degree 3 shows that the predicates are three-placed. “Peter bought a car by Ivan” (1); “Ivan sold Peter a car” (2); “A car is sold by Ivan to Peter” (3) are typical statements of this language. The introduction of coordinates “I-here-now” allows of saying “John considers that...” Thus, this language consists of all full propositions about the world:

(1) “A red rose”, “*x* is red”, or R_1 (x), is a predicative, monadic relation;

(2) “A car is near a house”, or R_2 (x, y), is a non-predicative, dyadic relation;

(3) “Mary gives John a book”, or R_3 (x, y, z), is a triadic relation, etc.

(4) ““A rose is red” is true” or “*f* R (x) is true for some R”;

(5) “John considers a rose to be red” or “A considers R (x)”.

The propositions (1), (2), and (3) are “atomic”. They form the “primary” or “object” language” in logical sense. The proposition (4) relates to the language of higher order, to the “secondary language”. The proposition (5) is a special class of expressions.

The language of the first order – “primary” or “object” language – consists of words expressing observable qualities – *red, solid, hot*, etc. acting as predicates; although they can be “names” in syntactic sense. In Language-3, there are proper names like “Caesar”, “Brutus”, too. Such words refer to existence of sensual objects. Language-2 is the proposition (4) (with semantics and syntactics), and Language-3 is the proposition (5) with egocentric words (with semantics, syntactics, and pragmatics).

3.6. Language Structures

The structure of language as we have already found out above is only a part of its system. This structure is subjected to direct observation by means of in-depth linguistic studies from different backgrounds. There exist distributive, opposite, functional, transformational and other structures. Each structure is a result of the consecutive description of language from a certain viewpoint; therefore, it is a theoretical creation of a linguist. It reflects more or less precisely those parts which objectively exist in language as its own structure. Thus, such structures as distributive,

opposite, etc., it is convenient to call not “theoretical structures” (that would emphasize their subjective part as a result of creation of a linguist) and not “language structures” (that would lead to a false representation of different structures), but to use a more general term – “linguistic structures”. We understand further under linguistic structure only what is based on clear linguistic principle. Therefore, each structure considered below corresponds to one concept which is mainly used in it. This concept gives the name to the whole structure. In the heading of each paragraph, it appears the first.

Distributive Structure

The development of distributive structure of language was the main achievement of the American linguistic school in boundaries of the 1950s; it was called descriptive linguistics. Descriptive linguistics arose in the 1920s in the USA. The studying of Indian languages of America, which did not have writing or handwritten grammars and dictionaries, was its initial task. The researcher, naturally, could not address to native speakers for essential explanations. The linguist had to rely upon objective observation – the stream of the Indian speech; the other material – grammar and vocabulary – he/she established through scientific analysis. In these conditions, the linguist found out methods of precise description of languages without referring to the sense, which would be impossible to carry in any case.

Three linguists were founders of this direction: Mr Boas (1858-1942), Mr Sapir (1884-1939), and Mr Bloomfield (1887-1949). Mr Bloomfield strictly defined the ordering of methods and main concepts. His study could be applied to all languages and grammars freely from psychological entities.

The concept distribution is a general concept in descriptive method. Under distribution, one usually understands a set of surroundings containing basic elements among which the first one belongs to speech; phonemes are surrounded by other phonemes, words – by other words, etc. The initial point is thus speech; the final is the establishing of distributive structure of language. This result is achieved by application of the two-level procedure consisting a) in establishing of elements, b) in distribution of these elements to each other and to their entrance into classes.

The procedure is to be applied twice: 1) for the definition of phonologic elements (phonemes) and the relations between them, 2) for the definitions of morphological elements (morphemes) and relations between them. Relations between morphemes or classes of morphs build a construction, which can coincide with separate statements (sentences) or be smaller than it is, but it cannot surpass it somehow. Thus, the field of language phenomena studied by descriptive linguistics ranges from phonemes to construction, or from a sound to a sentence. Constructions, surpassing a sentence in length (for example, a paragraph structure), are not considered in classical descriptive linguistics.

General distribution includes the whole set of surroundings. When determining general distribution the position of an element is also taken into consideration. The position is understood as a situation of an element at the end, in the beginning or in

the middle of a syllable, morpheme, or word; a situation as to an accent, tone, etc. There are three types of distribution.

If by comparing the general distributions of two elements it turns out that there are no such contexts where these distributions coincide, such two elements are in the relation of additional distribution; that makes the first type.

Additional distribution is necessary, but not always a sufficient condition for the recognition of a number of sounds to be one phoneme. So, for the reference of various types of a vowel in Russian to one phoneme, it is enough to establish between different sounds the relation of additional distribution: T'AT' is the most closed variant (T is any consonant, A is any vowel); T'AT – more open; TAT' – even more open pronounced after hard and before soft consonant; TAT – the most open variant.

In the same way, on the basis of additional distribution the variants of one phoneme have to be recognized [i] and [y] in Russian as the first always meets after soft consonants or at the beginning of a word, and the second – only after hard consonants and never at the beginning of a word. However, in language there can be sounds which are in additional distribution but never considered variants of the same phoneme. So, in the English, German, Danish, Swedish languages there is a sound [h] which is only at the beginning of words and morphemes, and a sound [ŋ] which is only at the end of words and morphemes.

The second type of distribution is contrast distribution. The units of speech are in contrast distribution if they are in the same surroundings and thereby distinguish sound forms of words (if it is phonemes) or values (if it is morphemes). In this case, they are representatives of different units – phonemes or morphemes. These are in Russian initial consonants – *dok, rok, mok, kok, sok, shok*, etc. In contrast distribution, there are, for example, morphs *-yushch-* and *-vsh-* in Russian, belonging, therefore, to different morphemes: *stradayushch-iĭ* and *stradavsh-iĭ*. Sometimes it is considered that for establishment of phonologic distinction it will be enough two-three or even one couple with the contrast. So, phonemes [ʃ] and [ʒ] in English are allocated on the basis of only four minimal couples: 1) mesher ~ measure, 2) dilution ~ delusion, 3) Aleutian ~ allusion, 4) Asher ~ azure.

Many researchers do not recognize sufficient to have one couple of elements with the contrast for establishing the distinctions of phonemes.

The third type of distribution is a free variation: the elements are in the same surroundings and do not distinguish sound forms of words or values. In this case, they are variants of the same unit of language. An example of free variation will be explosive [г] and fricative [γ] (Russian literary norm is [г] explosive). In free variation, there are variants of a morpheme *-oĭ-/-oiu-* of instrumental case.

If the descriptive phonology establishes the classes of interchangeable backgrounds and these classes practically coincide with phonemes, then the descriptive morphology establishes not morphemes but classes of interchangeable morphs. All morphs of one class replace each other almost in each surrounding belonging to this class. The surroundings themselves build the classes of morphs. For example, "He... -s home" builds a surrounding for such a class of morphs as *run-*, *go-*, *fly-* with the value of movement.

Similar classes of morphs are united in a wide class of verbal morphs, which can be designated with the Latin letter *V*. The basis for further operations, for example by determining constructions, is not morphs, but classes of morphs. (In particular, a construction may be formed as V + N, verb + noun.). The establishment of classes of morphs through co-occurrence is made through tests by substituting different morphs in the same surrounding or by substituting different surroundings to one morph.

The minimal class of interchangeable morphs (usually one-two, sometimes three-four morphs) at which the greatest number of surroundings coincides makes a morpheme.

At the syntactic level, the analysis through "immediate constituents" is originally applied since the studies of Mr Bloomfield and Mr Harris. This analysis came instead of the analysis through sentence parts which application demands appealing to extralinguistic reality and often leads to unambiguous results. The partition of a sentence on "immediate constituents" is carried on statement on the differentiation of two types of constructions: endocentric (phrases with the main member) and egzocentric (phrases without the main member). Endocentric construction functions like one of its members and represents the distribution of the main member: a friend → a good friend → my good friend → one my good friend. In this case, one usually says that construction expands. At the movement in the opposite direction, construction decreases up to the main member:

D + A → A, where D is a determinant (an adverb, a numeral, an article);

A + N → N, where A is an attribute-adjective, N is a noun;

V + N → V, where V is a verb (a predicate + an object in accusative case decreases up to a predicate).

Oppositive Structure

In the course of the logical description of any language, the identification of opposite structure begins when the main units of the language established by distributive analysis are already known to the researcher.

Depending on that what part of language he/she wishes to describe, the linguist chooses a group of units of this part – phonemes (for the description of phonology), morphemes and word forms (for the description of grammars), a group of words (for the description of a lexicon). The group has to be at the very beginning full; however, it can be extended through the analysis too. The task of the opposite description consists in revealing all oppositions existing in this group of units.

The first stage is to establish binary oppositions and then to sum up all the system consisting of pair oppositions. By these descriptions, the linguist has to solve two main objectives: 1) the separation of essential oppositions from those of insignificant, 2) the separation of logical oppositions from linguistic ones.

Let us show the work of a linguist on the example of a group of four Russian phonemes: p, p', b, b'. In this class of phonemes there are following pair oppositions: 1) p ~ p', 2) p ~ b, 3) b ~ b', 4) p' ~ b', 5) p ~ b', 6) p' ~ b (the opposition with rearranged members are considered analogously: p ~ b is the same as b ~ p). Among them, the first four are more important, the others are less significant.

When summarizing the description of the chosen class of the Russian phonemes, it is possible to establish the following system of oppositions.

Table 2

	Positive feature "sonority"	**The lack of positive feature "non-sonority"**
Positive feature "softness"	b'	p'
The lack of positive feature "non-softness"	b	p

Semiological Structure

The semiological system is by no means identical with the "category of the sign". It requires that language be treated as a multi-level organisation. By the layer (or "level" in the first sense) of language we mean the aspect of language which has a corresponding eponymous unit – the phoneme level, whose unit is the phoneme; the morpheme level, whose basic is the morpheme, and so on. By level in the proper ("level" in the second sense) we mean the degree of generalization and abstraction – the level of observation, the level of types, and the level of constructs.

The hierarchy of language can be schematized in the following form.

Table 3

Levels of abstraction	**Levels as aspects of language**				
Unique:	the sound of speech	allomorph	contextual variant of a word	collocation-syntagm	utterance
Particular:	sound type	allomorph-type	lexico-semantic variant of a word	syntagm as unit of lexis	phrase
Universal:	phoneme	morpheme	lexeme	structural schema of syntagm	structural schema of phrase

In each language the primary apparatus of the nominative function is that nominal classification which most directly reflects in the speech situation (the utterance) the basic semantic opposition man/not man, thing. In languages with a so-called active structure, this classification consists of a division of nouns into "active" and "inactive" classes with a corresponding division of verbs. In the Bantu languages it is the prefixal classes (the number of which is known to reach 23). In the IE languages it is the suffixal classes, and in the PIE period the root classes. For example, the reconstructed root **ped-* 'foot' belongs to the "active or animate" class, while **pedo-* 'footprint' to the "inactive or inanimate" class. The grammatical genders in the IE languages and in Bantu clearly emerged on the basis of such classes. It is possible therefore from a general typological point of view to assume the following line of development: "active-inactive classes" → "suffixal-prefixal classes" (like those in the Bantu or Daghestani languages) → "grammatical genders".

In general all the suffixal classes of the IE languages in one way or another form part of declensional series characterized by the last sound of the stem. Since it is precisely in the shape of the stem of the IE noun that we find formal traces of their previous state – the division of nouns into "active-inactive" classes (cf. **ped-* 'foot', **pedo-* 'footprint'), these declensional groups and, consequently, suffixal classes can be regarded as a stage which typologically follows the "active" classification.

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PART II
SCIENCE OF LANGUAGE

CHAPTER ONE
PHONOLOGY

1.1. General Phonetics

The division into vowels and consonants exists in many languages. The Greeks distinguished “phōnēĕnta” from “symphōna” which the Romans adopted and transmitted to us. In the Chinese language, the consonants are called “tsee moo” (mother sounds) and the vowels “nyĕh” (auxiliaries) which equal the German expressions “Hauptlaute” and “Hülfslaute”. It also concerns the Hebrew alphabet because Jewish grammarians call the vowels “the souls of letters” and the consonants “the bodies of letters”. The Arabs gave to the first the name “movement”, and to the seconds that of “sharp edge” or “hhrafe”. Here we recognize the traces of deep analysis, which is perfect for Vedic Sanskrit. In the absence of writing, the differences in pronunciation were observed by ear. This analysis extends to the Tibetans where consonants are called “yan lag” (member, join). The name of vowels is “dchang”, (voice, modulation). We see again that this application is identical to those in Devantagari alphabet. In the vocal hymns, it is said that consonants form the body of speech, while vowels constitute the soul.

From the sounds of the primitive language, all the sounds in the different Aryan languages have been developed according to certain phonetic laws. The primitive language in its most primitive form was limited to the three typical vowels, which later on, certainly before the first breaking up of the Aryan family, were multiplied by the *a* entering into combination, first with its own like, and then with the two other vowels. Thus, we get the following table of gradation of sounds, according to Mr Helfenstein:

Primitive	*I. Gradation*	*II. Gradation*
1. a	a+a=aa	a+a=âa
2. i	a+i=ai	a+ai=âi
3. u	a+u=au	a+au=âu

The vowel *a* is so characteristically distinct from its two fellows that it may be considered as a class of its own in contradistinction to that which comprises the vowels *i* and *u.* The latter have in their suit, and are often replaced by, the consonants, or semivowels, *j* and *v,* while *a* never passes into a consonant, and thus displays more energetically its vocalic nature. Long vowels did not exist in the primitive language; where nevertheless they occur equally in different Aryan dialects, as Skr. *pitâ (rs),* Goth. *fadar=fathâr,* etc. Mr Schleicher supposes them to be of later introduction, perhaps of a period when the different languages had already separated; and he there-

fore claims for the last-mentioned words in the primitive language the genuine form *patara*.

Mr Schleicher was the first to reconstruct the Ursprache or original IE language. Previous scholars had been content to reduce the existing forms of one language to the corresponding existing forms of another related language. Mr Schleicher went beyond this and attempted to reproduce the primitive forms from which all the existing forms are derived.

The first difficulty that meets us in such attempts is the question how we can determine what is primitive and what is secondary. How many vowels had the original language? How many consonants? To these questions, Mr Schleicher answered very different from that which would be given now. At the beginning of his Compendium, he asserts the existence in the original speech of the following sounds (see works by Mr King and Mr Cookson):

Consonants *k, g, p, b, t, d*.
Spirants *j, s, v, n, m, r*.
Vowels *a, i, u, aa, ai, au*.

To these were added the aspirates *gk, dh, bh*, the liquid *l* and the diphthongs *āa, āi, āu*. The new school of philologists would recognise the aspirates as primitive, add a second row of gutturals, and a series of semi-vowels, including the nasal and liquid sonants; *i* and *u* would cease to rank as vowels proper, and the original vowels would be given as *a, e, o*.

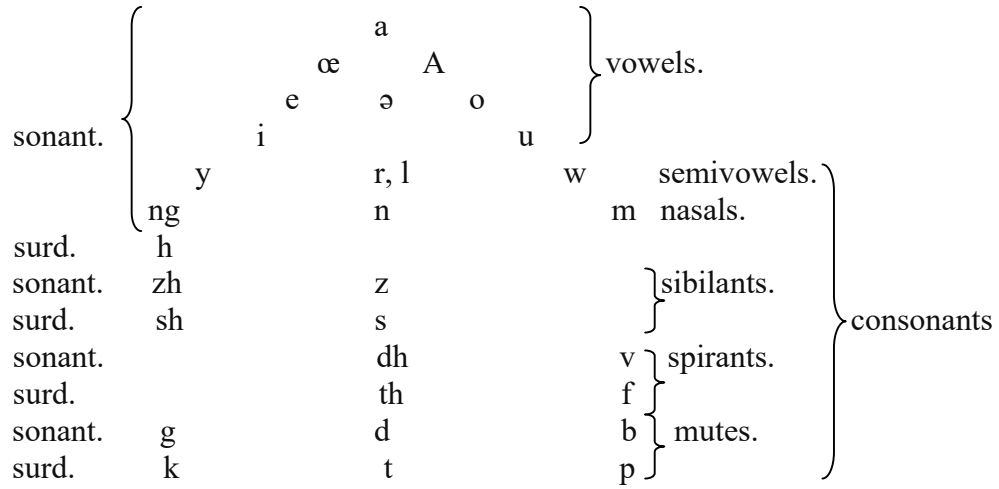
If we accept the hypothesis that all languages of what we call the IE family are eventually derived from primitive language, we are bound to show that the facts of the derived languages are consistent with this hypothesis, or else to modify the hypothesis in accordance with the facts. According to Mr Kolbe, the primitive language would appear to have commenced with seven sounds, represented in the following scheme:

m
p_____u
t_____i
k_____a

From these principal letters evolved the aspirates or stronger sounds, *kh, th, ph*, and, on the other hand, the medial or softer sounds, *g, d, b*. The great variety of vowel-sound can, as is well known, be traced back to the three primary vowels *a, i, u*, the pronunciation being as in German and Italian. The vowel *a* corresponds to the guttural *k*; *i* to the dental *t*; and *u* to the labial *p*.

Any human articulation is modification of three consonants and three vowels which we find almost everywhere in pure state. They are the immediate product of the contact of three principal organs of speech – throat, teeth, and lips, whence result

three classes of gutturals, dentals, and labials. They produce the whole complexity of phonological system, introduced by Mr Whitney:



"The scheme may be taken as a *general model*, on the plan of which the spoken alphabet of any language may best be arranged. The primitive language had not half the sounds given in the scheme; and those which it had were the extreme members of the system: among the vowels, only *a, i*, and *u*, the corners of the vowel triangle; among the consonants, mainly the mutes, along with the nasals *m* and *n*, which are also mutes as concerns their mouth-position; of the whole double class of fricatives, only the *s*. The *l* was not yet distinctly separated from the *r*, nor the *w* and *y* from *u* and *i*".

The vowels *a, i, u* change and become much more difficult than consonants. The consonants also have three main degrees in their articulation, and the prototype of each of them is in three following articulations: guttural *K*, dental *T*, labial *P*. They are the basis of the system of Aryan consonants. We try to give in the following table the complete exposition of true system of consonants on which are formed different languages of the IE family. The Sanskrit alphabet alone possesses it almost completely. Thus, it expresses by consonants the gradations of sounds in any language.

Table 4

General System of Aryan Consonants

Consonants	Explosive	Mute consonants. Complete articul. with aspiration	Soft aspiration	breath	p	t	k
				breathless	b	d	g
			Hard aspiration	breath	ph	th	kh
				breathless	bh	dh	gh
	Continuous	Souffle sounds. Incomplete articulation with aspiration			f	s (high)	ch
		Sonants	Semivowels	breath	v	s	y
				breathless	w	z	j
			Liquids	oral	-	l	r
				nasal	m	n	ng

If we compare the same roots of Sanskrit, Greek, Latin, Celtic, Slavonic, Lithuanian, Gothic and High German, we will conclude the following. First, the Lithuanian, Slavonic, and Celtic races are pronounced similar to Gothic so that we get the formula:

Greek and Sanskrit	KH	TH	PH
Gothic	G	D	B
High German	K	T	P

Second, if in Greek, Latin, Sanskrit, Lithuanian, Slavonic, and Celtic we find a soft explosive consonant, we will find in Gothic an explosive strong consonant and in old High German an aspirate.

Greek	G	D	B
Gothic	K	T	P
High German	CH	Z	F (PH)

Third, when the six languages named above show a strong consonant, Gothic shows the aspirate and the High German the explosive. In the High German however, the law is valid for dentals, for the labial and guttural series old documents show H and F instead of G and B. This gives the third formula:

Greek	K	T	P
Gothic	H (G, F)	TH (D)	F (B)
High-German	H (G, K)	D	F (B, V)

The letters must be considered as pure symbols. We translate these symbols into the following table, which represents Grimm's Law at least for the main consonants. It is possible to establish by further examination equivalences of consonants in the Germanic languages, on the one hand, and in the Romance languages, on the other. It has still been pushed so far into other language families, except certain parts of the Semitic family, which offers considerable homogeneity:

Arabic	D	DZ	T	TS	‘T	‘TS
Hebrew	D	Z	T	SH	‘T	Ç
Aramean	D	D	T	T	‘T	‘T

According to this table, *ç, sh* and *z* in Hebrew correspond to ‘*ts, ts, dz* in Arabic, while the Aramean idioms invariably substitute ‘*t, t, d*. Professor Bœhtlingk, in his Yakut grammar, has succeeded in giving the law and order to these phonetic changes which sometimes appear wider than those admitted between the Aryan languages. Mr Castrèn considers $k = t$ as susceptible equivalence. He says that final *t* may soften by wheezing, but this sibilant strengthens in case of guttural sounds. He frequently considers *t* and *n* to be exchanged and seems to admit an identity of origin for the plural

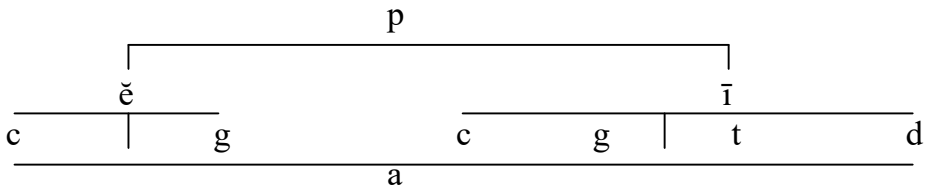
endings *t, k (h), je*, *saň*, *säň*, *la*, etc. In Syrian grammar, he derives “jas” and compares final *s* with Lappish *h* and Finnish *t*.

Thus, the permutation of guttural and dental is not extraordinary; it is not found only on the Sandwich Islands, in Mexico, in the Makua language of Southern Africa, etc. In Canada, the lower classes make the same confusion: “mékier”, “moikié” for “métier” and “moitié”. Without looking so far into this permutation, we can find examples in speech of peasants around Paris and several other large cities, because they say “charkié”, “abricokier”, “squié” for “charretier’, “abricotier”, “sétier”. In Paris, some people say “crapu” for “trapu”. There is apparently only one Latin word that has undergone this permutation: “tremere” which first became “cremre” and then “craindre” with epenthesis of *d*.

These exchanges of consonants are even less noticed than a fact, which sometimes appears. For example, when articulation in one language replaces articulation of words borrowed from other languages. This is the case especially common in Spanish. The aspiration of *jota* is very old in Spain. It replaced not only *li* in the Latin words or dialects of Latin, such as *filius, mulier*, although *l* and *i* existed in Spanish, but also *f* by pronouncing *g, h*. In few words borrowed from Arabic, the letter *djim* became *jota*, while *khe* is identical to *jota*, and the aspirated *ha* changed to *f*; “elkhordj”, for example, became “alforjes”. The *jota* is two and a half times more used in Spanish than in Arabic.

Such changes may appear not through pure fantasies, and if the jump from guttural to dental, aspirate and sibilant were admitted as general principles, applicable to every word being right or wrong, it would be the end of serious etymology. But there is a great difference whether or not you apply such principles to history. The Armenian *hayr* is the same word as the Latin *pater* not because *p* changes to *h*, but because it can be proved by the facts. Just as “mater” becomes “mayr” in Armenian, “pater” must be “hayr”. If we know that languages are allied historically like, for example, Latin and French, we can establish in fact, that *lacryma* can be changed into *larme*. We can even go further and say that “dakru”, “tear” and “larme” are derived from the same root. But if, from there, we would assert that *dak* could always be changed to *tor*, and from there identify the Turkish plural *lar* or the Tibetan plural *dag*, we would no longer be on historical ground and work in the spirit of the Bopp’s system.

Suppose one seeks for the Latin antecede of the French *pie* (bird) which we imagine for the moment isolated in the Romance languages. There is hesitation – from the strictly phonetic point of view – for the determination of the Latin prototype because for each phonetic element the antecedent is variable. Thus, the French initial *p* is derived only from Latin *p*; but the tonic of *pie* can be issued either from *ī*, or from *ĕ* followed by a palatal. In the same way, the final sound (preceded by a vowel) comes only from Latin; but the hiatus could be filled by one of the sounds *t, d, c, g* (only *c-g* after *ĕ*). We thus arrive at a hypothetical reconstitution of the possible Latin antecedents formulated as follows:



All combinations (*pĕca, pĕga, pīca, pīga, pīta, pīda*) are admissible from phonetic point of view. Which is one to choose? In the example proposed, we immediately find the Latin word *pîca*. But it is rare that the etymology can be discovered so easily. Sometimes, for a single word, there are thirty possible combinations, and despite the abundance of choice, it often happens that none of these combinations correspond to a known Latin word.

1.2. Sound Changes (I)

The "phonetic law" rests its claim to recognition not upon a causal explanation but upon its relative universality. That is to say, "Because a certain sound change can be observed in a large mass of cases, it is elevated to the rank of a "phonetic law". The question why such a change took place is not asked. It is only in the case of "exceptions" that we meet the demand for a causal explanation.

It is true, suggests Mr Oertel that "some of our "phonetic laws" imply that the conditions under which the change takes place are its cause. E.g., the law which states that Primitive Greek τ before unsyllabic $\dot{\iota}$ changes to σ carries with it the implication that the $\dot{\iota}$ assibilated the τ. In the Ionic "sound-law" Primitive Greek α changes to η or the English "sound-law" that Old English long *a* (nāme) changes in Middle English to *e* (name). Why such a change takes place the "law" does not inform us. The fact that the change is relatively universal is sufficient to establish the "law". The term "law", therefore, is used in grammar with a peculiar and special signification. It stands for a formula by which a large mass of phonetic correspondences are summed up".

We have seen yet the Sanskrit, Greek, Latin and Slavonic languages have generally preserved the consonants as they originally were, except local changes. But the Germanic languages show a change. The original aspirates have fallen together in the old Germanic language and are represented alike by hard spirants; i.e. *p, t, k*, and *ph, th, kh*, are represented by old Germanic (e.g. *Gothic*) spirants *f, þ, χ*, (pron. *ch*). This is called sound shifting of the Germanic languages, or simply Grimm's Law. This, however, is only the first sound shifting, which took place even before the Christian era, as certain references of the old Roman historians show. There was another sound shifting, which appears to have taken place after the Anglo-Saxons separated form their North-German cousins, about the seventh century. The summary of Grimm's Law may be tabulated thus:

Table 5

	ARIAN				GERMANIC			
Breathed stops	*k*	*t*	*p*	become	*h*	*Þ (th)*	*f*	Breathed spirants
Voiced stops	*g*	*d*	*b*	become	*k*	*t*	*p*	Breathed stops
	kh	*dh*	*bh*	become	*g*	*d*	*b*	Voiced stops

The evolution of the same root in different languages is illustrated by Grimm's Law of regular interchange between (1) Sanskrit, Greek, and Latin taken as one group, (2) Gothic and Low German dialects (including English), (3) High German and its stock (including modern German); the one having an *aspirated mute* (or fricative representing the aspirate) where the second has a *media* and the third a *tenuis*. The following formula expresses this law:

Table 6

	I	II	III
(1) Sanskrit, Greek, Latin	Aspirate	Media	Tenuis
(2) Gothic and Low German	Media	Tenuis	Aspirate
(3) High German, etc.	Tenuis	Aspirate	Media

The regular action of Grimm's Law is sometimes interfered with by other agencies, e.g. by the accent. To this are due such forms as *Mutter, Vater*, beside *Bruder*; for in Sanskrit we have *mātár, pitár* accented on the last syllable, but *bhrátar* accented on the first. Such different forms, again, as *sieben* and *fünf* (seven and five) are accounted for by finding *saptán*, but *pánchan*. Again, the various phonetic tendencies in different languages – e.g. assimilation, the loss of *s* between vowels in Greek, or its change into *r* in Latin – may interfere with the Grimm's Law.

Table 7

General Table of Grimm's Law

Original Sounds		**A**			**B**	**C**
		Sanskrit	Greek	Latin	Gothic, Low German	High German
Aspirates	KH	gh (h)	χ	h, f (g, v)	g	k
	TH	dh (h)	θ	f (d, b)	d	t
	PH	bh (h)	φ	f (b)	b	p
Mediae	G	g (j)	γ	g	k	ch
	D	d	δ	d	t	zz
	B	b	β	b	p?	f, ph
Tenues	K	k	κ	c, qu	h, g, (f)	h, g, k
	T	t	τ	t	th, d	d
	P	p	π	p	f, v	f, v

Theoretically, there are no exceptions to a Phonetic Law. Accordingly when certain words were found to violate Grimm's Law philologists began to look about for other laws whose action interfered with it and produced the anomalous forms. The result of their investigations was the discovery of three laws, Grassmann's Law, Verner's Law, etc.

Grassmann's Law accounts for such anomalies as:

κνχάνω	Goth. *gaggan*	Eng. *go*
τνφλός		Eng. *dumb*
πίθος		Eng. *body*

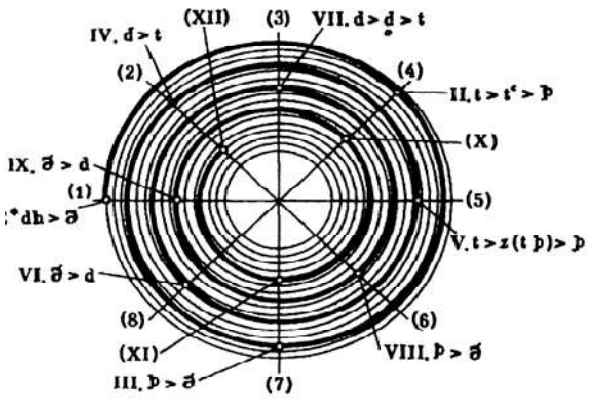
Here according to Grimm's Law we should expect the English words to be *ho*, *thumb*, *fody*. Mr Grassmann, however, comparing *ἓχω ἓξω, θρίξ τριχός,* and similar pairs, found that in Greek and Sanskrit a syllable cannot both begin and end with an aspirate or aspirated stop, hence

κνχάνω	represents	*χνγχάνω*
τνφλός		*θνφλός*
πίθος		*φίθος*

Verner's Law explains why in some Germanic words Aryan *k, t, p* are represented not by *h, þ, f,* but by *g, d, b*. The best instances (for English) are words containing Aryan *t*: *altus* → *old, centum* → *hund-red*, *in-clutus* → *loud.*

Here Grimm's Law would give us *olth, hunthred, louth*. Verner's explanation is that if the preceding vowel in the Aryan word did not bear the accent, *k, t, p* in Aryan became *g, d, b* in Germanic instead of *h, þ, f*.

Since Grimm's reconstruction, the volume of works about sound shifting has reached unbelievable range. In this attitude, we resume Grimm's Law with Prokosh's study on comparative grammar of the German languages throwing more light upon it. In general, Mr Prokosh represents phonetic changes on the example of dentals t > t' > þ > θ > ð > d > ḍ > t that corresponds in its turn to Fourquet's reconstruction:



There are also Sievers' Law, Hirt's Law, Brugmann's Law, Winter's Law, Leskien's Law and Fortunatov's Law which we will not concern here.

1.3. Sound Changes (II)

The difficult question about the nature and the causes of spontaneous and regular sound change is irrelevant to the theoretical foundations of comparative linguistics. Mr Grimm revealed regularity between vowels in the Germanic languages. He also proved that they were the same in Greek and Latin. In addition, Mr Grimm explained the changes in sounds which he called *Umlaut*. It is the changing of a vowel under the influence of the vowel in a following syllable, especially under the influence of *i* or *j*, *u* or *w*. The non-umlauted vowel is always preserved in Gothic, which shows the causes of Umlaut, whereas those causes have usually been obliterated in the languages where Umlaut has developed (see works by Mr Pedersen).

Gothic	*sunus*	(son) plural	*sunjus*
Modern High German	*sohn*		*söhne*
Swedish	*son*		*söner*

Mr Pedersen revealed, “In many cases, Umlaut can be established by comparing related words: “full” shows that the *i* in “to fill” is an Umlaut. Umlaut is present also in Old Norse *fylla*, Modern High German *füllen*, but it takes the Gothic form, *fulljan*, to show us the cause of the Umlaut. Often it is only by means of a comparison of the different languages that we can determine whether Umlaut has occurred; the non-umlauted vowel is found in Gothic. The vowel in English “berry”, Modern High German “Beere” is an Umlaut of *a*: cf. Gothic *basi*; but the vowel in *to bear*. Modern High German *gebären* is an old non-umlauted vowel (and the two words *berry* and *to bear* have nothing to do with each other)”.

Rückumlaut is a term used by Mr Grimm “to indicate that owing to the early disappearance of an *i* or *j*; the Umlaut did not take place and the original vowel was retained. This, for example, was the case in the preterit and past participle of weak verbs of the first class, the root syllable of which was long by nature or position (see 1st weak conjugation). Ex: M.H.G. *hoeren*, pret. *hōrta*; *brennen*, pret. *branta*. Likewise in the sing. masc. of the *i* declension and the adverb of the *ja* stems, adv. *fasto*, adj. *festi*. The *i* or *j* that had caused the Umlaut may have later disappeared, but the effect remains. In O.H.G. the Umlaut is limited to *a*, the Umlaut of which was mostly written *e*, as *gast*, plural *gesti*, M.H.G. *geste*; *lang*, comparative *lengiro*, M.H.G. *lenger*. In M.H.G. the Umlaut was extended to the following vowels and diphthongs”:

Table 8

			O.H.G.	**M.H.G.**	**Mod. H.G.**
ā	Umlaut	ae	*nāmi*	*naeme*	*nähme*
o		ö	*lochir*	*löcher*	*Löcher*
ō		oe	*hōhir*	*hocher*	*höher*
u		ü	*kunni*	*künne*	-
ū		iu	*hūsir*	*hiuser*	*Häuser*
ou		öu	*bougen*	*böugen*	*beugen*
uo		üe	*kuoni*	*küene*	*kühn*

Mr Pedersen suggested, “Gothic casts a clear light on Umlaut in all the other Germanic languages, as well as on several other points in the vowel system. For this reason, Mr Grimm concluded that the Gothic vowel system is in all respects older than that of any other Germanic language. Gothic has only three short vowels, *a, i*, and *u*; this Grimm regarded as the original Common Germanic condition”. ‘That was an error”, how it suggests Mr Pedersen; “for Mr Grimm cannot assume that there were less than four vowels in the Common Germanic language: in addition to the *a, i* and *u* there was an original *e*. In a case like Old Norse *eta* “to eat”, Old English and Old Saxon *etan*, Modern High German *essen*, Gothic *itan*, it is not the *i* of the Gothic form which is the original, but the *e* of the other languages”. Mr Pedersen proposes that “Mr Grimm made matters worse by citing Sanskrit, which likewise has three short vowels, *a, i,* and *u*. Actually, the Sanskrit system of three strengthens is in no way the Gothic system of three; for the two systems do not correspond etymologically. On the contrary, the relationship is essentially as follows”:

Table 9

Sanskrit	*a*		*i*	*u*
Gothic	*a*	*i*	*i*	*u*
Old Norse, etc.	*a*	*e*	*i*	*u*

Sanskrit *ad-mi* “I eat” shows that the *i* in Gothic *itan* is not original. Grimm’s misinterpretation was possible only because comparative linguistics was in its infancy. Yet his conception remained current for some time. He went a step farther and referred to the fact that in Semitic also (e.g. in Arabic) there are only three original vowels, *a, i*, and *u*. Since Grimm did not postulate any relationship between IE and Semitic, it must be inferred that he regarded the *a, i, u* system as the common basis for human language.

This conception Mr Grimm applies to those old alternations of vowels in the Germanic languages which he calls *Ablaut*. In contrast with Umlaut, Ablaut is present in the Germanic languages from the most ancient period. While the cause of umlaut was clear enough to Grimm, nobody at that time could have discovered any phonetic reason for Ablaut, either within or without the circle of the Germanic languages. Ablaut is the alternation of vowels which we have in the verb forms *begin, began, begun*, Gothic *du-ginnan, du-gann, du-gunnans*. This type of alternation occurs throughout the entire Germanic group.

Ablaut appears particularly in the conjugation of the strong verbs; the infinitive and present, the singular of the preterit, the plural of the preterit, and the past participle, showing different vowels. In declension, Ablaut has left few traces, but Ablaut plays an important part in derivation. Here follow the six O.H.G. Ablaut series, together with the corresponding ones in Gothic:

Table 10

Inf. Pres.	Pret. Sing.	Pret. Pl.	Past Part.
Old High German			
ī	*ei (ē)*	*i*	*i*
eo, iu	*ou (ō)*	*u*	*o*
i (ë)	*a*	*u*	*u, o*
ë, i	*a*	*ā*	*o*
ë, i	*a*	*ā*	*ë*
a	*uo*	*uo*	*a*
Gothic			
ei	*ai*	*i*	i (aí before *r, h*)
iu	*au*	*u*	u (aú before *r, h*)
i(aí)	*a*	*u*	*u(aú)*
i(aí)	*a*	*ē*	*u(aú)*
i(aí)	*a*	*ē*	*i(aí)*
a	*ō*	*ō*	*a*

1.4. Sound Changes (III)

In Indo-Germanic languages in the primeval times, certain phonetic changes began. The prototypes of subsequent languages were formed. The causes and mechanism of the PG consonant shift have been a matter of discussion ever since the shift was discovered. When Mr Grimm first formulated the law of the shift, he ascribed it to the allegedly daring spirit of the Germanic tribes, which manifested itself both in their great migrations and in radical linguistic innovations.

Some philologists attributed the shift to the physiological peculiarities of the Teutons, namely the shape of their glottis: it differed from that of other IE tribes, and the pronunciation of consonants was modified. Other scholars maintained that the consonant shift was caused by a more energetic articulation of sounds brought about by the specifically Germanic force word stress. Another theory suggested that the articulation of consonants in Germanic was, on the contrary, marked by lack of energy and tension.

The theory of “linguistic substratum” attributes the PG consonant changes – as well as other Germanic innovations – to the influence of the speech habits of pre-Germanic population in the areas of Germanic settlement. The language of those unknown tribes served as a sort of substratum (‘under-layer’) for the Germanic tongues; it intermixed with the language of the Teutons and left certain traces in PG. This hypothesis can be neither confirmed nor disproved, since we possess no information about the language of pre-IE inhabitants of Western Europe.

According to recent theories proposed by Mrs Rastorgueva, “the PG consonant shift could be caused by the internal requirements of the language system: the need for more precise phonemic distinction reliable in all phonetic conditions. Before the shift (according to Mr Kurylovicz) the opposition of voiced and voiceless plosives was neutralised (that is, lost) in some positions, namely before the sound [s]; there-

fore new distinctive features arose in place of or in addition to sonority, [p, t, k] changed into [f, θ x] and began to be contrasted to [b, d, g] not only through sonority but also through the manner of articulation as fricatives to plosives. This change led to further changes: since [f, θ, x] were now opposed to [b, d, g] through their fricative character, sonority became irrelevant for phonemic distinction and [b, d, g] were devoiced: they changed into [p, t, k], respectively. That is how the initial step stimulated further changes and the entire system was shifted. It is essential that throughout the shift the original pattern of the consonant system was preserved: three rows of noise consonants were distinguished, though instead of opposition through sonority consonants were opposed as fricatives to plosives".

Another explanation based on the structural approach to language interprets the role of the language system from a different angle. Every subsystem in language tends to preserve a balanced, symmetrical arrangement: if the balance is broken, it will soon be restored by means of new changes. After the replacement of [p, t, k] by [f, θ, k] the positions of the voiceless [p, t, k] in the consonant system were left vacant; to fill the vacuums and restore the equilibrium [b, d, g] were devoiced into [p, t, k]. In their turn the vacant positions of [b, d, g] were filled again in the succeeding set of changes, when [bh, dh, gh] lost their aspirated character. This theory, showing the shift as a chain of successive steps, fails to account for the initial push.

Mr Schmidt showed links between Aryan and other IE families of languages. Teutonic and Slavo-Lettic change a primitive *bh* to *m* in certain case endings. Lettic and Teutonic replace *d* by *l* in the numerals eleven and twelve. Greek shares one form of the verb (the futurum exactum) with Latin, and three with Indo-Iranian. Iranian, Greek, and Slavonic change *s* into *h* between two vowels, and Iranian and Greek replace an initial *s* by *h*. Hence, we see that the great families of Aryan speech, Indo-Iranian, Hellenic, Celto-Italic, Teutonic, and Slavo-Lettic, are indissolubly bound together.

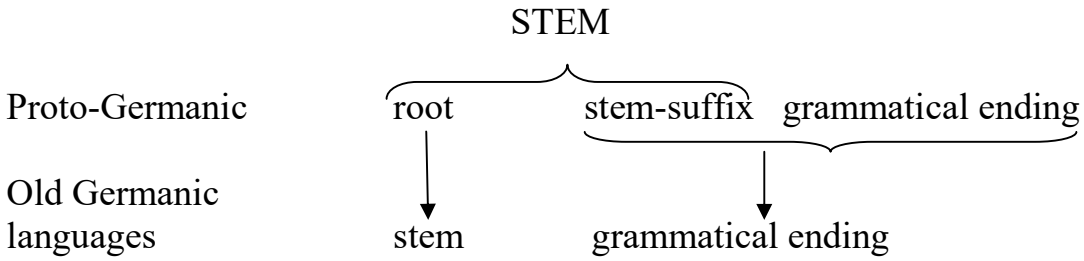
Mr Schmidt maintains that the Aryan linguistic area was at one time homogeneous. In various portions of this domain, he supposes that tendencies to variation arose, and spread like undulations from the centre of disturbance. Thus, in one spot a tendency may change the primitive guttural tenuis into a sibilant, so that the Greek *ἑκόν*, which is *cét* in old Irish, *cenhim* in Latin, and *hund* (= kunt) in Gothic corresponds to *çata-m* in Sanskrit, *sate-m* in Iranian, *suto* in old Slavonic, and *szinitas* in Lithuanian.

Mr Taylor supposes that there was a tendency to change the primitive *bh* in the case endings *-bhi, -bhis, -bhya(m)s*, to *m*, a tendency which only extended to the ancestors of the Slaves and Teutons, so that in place of the old Irish *fera-ib* and the Latin *hosti-bus* we get *vulfa-m* in Gothic, and *vluko-mu* in old Slavonic.

At a third point a new passive was formed, which extended to the Celtic and Italic languages, and perhaps more remotely to the Lithuanian, giving us the old Irish *bera-r* and the Latin *fero-r*. In the same way, Celtic and Teutonic were possibly affected by a tendency to denote past time by prefixes.

Some changes in the morphological structure of the word in Late Proto-Germanic account for the development of an elaborate system of declensions in PG

languages, and for the formation of grammatical endings. Originally, in Early PG the word consisted of three main component parts: the root, the stem-suffix and the grammatical ending. The stem-suffix was a means of word derivation, the ending a marker of the c grammatical form. In Late PG, the old stem-suffixes lost their derivational force and merged, with other components of the word, usually with the endings. The word was simplified: the three-morpheme structure was transformed into a two-morpheme structure. The original grammatical ending, together with the stem-suffix formed a new ending (see works by Mrs Rastorgueva):



e.g. PG **fisk-a-z* Gt *fisks* (NE *fish*)
PG **mak-öj-an* OE *mac-ian*, Past Tense *mac-ode* (NE *make, made*)

(In Gt *fisks* the stem-suffix was dropped, in OE *macian, macode* it merged with the ending, preserving one of the sounds – [i] or [o]). The simplification of the word structure and the loss of stern-suffixes as distinct components was facilitated – or, perhaps, caused by the heavy Germanic word stress fixed on the root.

Mr Schmidt assumed an original compact speech spread over a level plain, in which dialect-shades gradually arose. The strength of the theory lay in its explanation of the resemblances. The weakness of Schmidt's theory was its inability to explain the remarkable differences that soon grew up between dialects like Italic and Celtic, without the assumption of an enormously long period of development. There is still much room for skepticism in regard to all the schemes put forth, and Mr Brugmann has pointed out resemblances between groups for which no original juxtaposition has yet been assumed, e.g. Idg. *s* > *h* in Iranian, Greek, and Welsh, Idg. *ṇ* > *a* in both Aryan and Greek, and so on.

The wave theory is among the facts of observation since it corresponds to the situation observed on all linguistic maps. It does not account for the origins of a sound-shift, but for its progress; some other means must be found for determining an initial cause. The wave theory is opposed to the concept of language changing as a block. Language shifts also tend to complete themselves and to occupy the whole scene as viewed from their end and at a distance. Mr Entwistle rightly says that "IE **t* > Eng. *th* (thin/tenuis), IE **d* > Eng. *t* (ten/decent), IE **dh* > Eng. *d* (door/θύρα); and it would be vain to specify a centre of diffusion. Statements of this sort are made *as if* the whole language had shifted as a block, and they are valid inasmuch as the result affects the whole language".

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CHAPTER TWO
MORPHOLOGY

2.1. The Birth of Words

Words are signs for our ideas. They are signs oral and graphic, visible and audible; but still they have to satisfy the conditions, which govern all signs. The first of these conditions should be a univocal correspondence between the sign and the idea signified. The meaning of an idea is its fixed reference to some objective identity. As Mr Scheffield notes "the same image may in different contexts answer to different meanings. In one train of thought the image of a heap of goods might arise in the idea "wealth", in another it might mean "commerce", etc."

The more complicated question is that of etymology. "Why is a dog called a *dog*?", "a horse a *horse*?" "a table a *table*?", asks Mr Partridge. "For we cannot, except with echo-words and ejaculations, say why a certain speech-unit was uttered in respect of some nameless object, action, incident, situation, condition that, as a result of this utterance, finally arrived at the status of having a designation – an indicator – a name". Mr Partridge means that in English "a table" is called *a table* because the French word for the same object is *table*; the French comes direct from Latin *tabula*; the Latin may be traced to an Aryan original: but the proto-Aryan form (the earliest possible form) was caused by some accidental circumstance.

Mr Farrar supposed that "the word by which a man characterises himself in relation to his own consciousness would be mysterious and abstract, because it must express the notion of individuality and primary intuition". This, however, is far from being the case. Man regarded himself as an object and not a subject, and hence the objective cases of the personal as well as of the other pronouns are always older than the subjective, and the Sanskrit *mâm, ma* (Greek *fie*, Latin *me*) is earlier than *aham* (and ego).

Our general tendency is to isolate and learn the words as having certain fixed primary meanings (determined possibly by their frequency of occurrence) and then explain the additional meanings or senses that the user of a word may convey, as metaphorical extensions. Indian philosophers give an account of this phenomenon by identifying two different "powers" in a word: one is that of *saying* (abhidhdna) and the other is that of *pointing, signifying* or *indicating* (laksana). The first is called the primary meaning giving power while the second is called the secondary or indicatory meaning-giving power. By the first, the word *speaks,* as it were, while by the second it only *indicates,* and a metaphor is born. Consider Mr Matilal's example:

"The village is on the (river) Gaṅgā" (=*Gaṅgā yām ghosah*). The primary meaning of the word *Gaṅgā* is the river we call "Gaṅgā", but the sentence which locates the (fisherman's) village on the river Gaṅgā would be speaking about an impossible state of affairs if only the primary meaning of "Gaṅgā" is taken into account. Com-

mon rationality demands that we construe the meaning differently in order to make sense of the sentence uttered. Thus, by metaphorical extension the meaning of the word *Gaṅgā* is given (by its *indicatory* power) as "the banks of the Gaṅgā" and hence the sentence describes the situation that the village is on the banks of the Gaṅgā – a legitimate conclusion about what the sentence means or how the hearer is supposed to cognize its meaning in the context".

2.2. Meaning Changes

Since words and phrases do not stand isolated in a language, any change in the meaning of one word frequently disturbs other words, which are in some way connected with it. Often we also observe inconsistency between grammar of a language and logic. So "the notion of "person" is always expressed twice in our languages, once by the pronoun (or noun) which is the subject, and a second time by the form of the verb. Ancient languages, such as Latin, did not employ the subject pronoun with the verb: the person was indicated by the verbal form itself. As these verbal forms weakened and gradually became confused, it was felt necessary to indicate the person more precisely. Big changes occurred within etymology, too. Of interest are the semantic changes of the legal terms *damnum, noxia, culpa, casus*, and *fortuna*", which Mr Voigt has fully discussed and which are summarized in the following table taken by Mr Oertel:

Table 11

	Legal Terms for					
	Trust	*Damage*	*Guilt*	*Negligence*	*Chance*	
Older Period	damnum	noxia	culpa	causa	fortuna	
Later Period	——	damnum	noxia	culpa	causa	no legal terminology
	–					

Another example one can find by Mr Ghatage by the word *bigey* replaced the original word *gallus* for a cock in Gascony. The real picture of the events is not to be imagined as [cattus – gat – gat (gallus – gat – bigey)], but as [cattus – gat – gat (gallus (bigey) – gat (bigey) – bigey)]. This means, according to Mr Ghatage, that "the replacement was not simply caused by an inconvenient situation in the language due to the homonymy of the two words meaning "cock" and "ca" but that a spontaneous creative activity: had already at its disposal both the forms *gat* and *bigey* to express the idea of the "cock" and the structural situation was only the occasion for the elimination of the one and the retention of the other".

Internal processes spread out through the whole history of language formation and may be traced on different instances. An English instance is the word *horn*. The meaning of the word was specialized in a corresponding manner. The principal ele-

ment of its meaning changes; the notion “animal’s horn” recedes to a subsidiary position, and the notion “instrument of a certain kind” takes its place as predominant. The difference comes out clearly in the following diagram taken by Mr Stern:

Table 12

	I	**II**	**III**	**IV**
Word	*horn*	*horn*	*horn*	*horn*
Meaning	*ax*	*a(β)x*	*(a)βx*	*βx*
Referent	*ax*	*a(b)x*	*(a)bx*	*bx*
	Animal’s horn	Animal’s horn used for music	Musical instrument made from animal’s horn	Instr. for producing a certain kind of sound

Mr Stern says, “In the first phase, *horn* means simply “animal’s horn”; its main characteristic is *a*; irrelevant characteristics are denoted by *x*. In the second phase, *horn* denotes an animal’s horn which is used to produce musical sounds; this subsidiary characteristic is indicated by the brackets round *b*. The process of change is a substitution. In the third phase, such musical instrument has grown common and formed a definite category. In the fourth phase, *a* has completely disappeared, and *horn* is applied to instruments of the same type made from any material: this is a second substitution. The diagram enables us to distinguish clearly the primary substitution, the use of an animal’s horn for music, from the adequation through which the meaning of the word adjusts itself to the change in the referent. This tendency is closed to the metaphorical shifting of the meaning. The simple instance is the word *lion* being used to denote *a brave man*”.

Table 13

	I	**II**
Word	- - -	→ lion
Meaning	‘a brave man’ *(αβγ)*	‘lion’ *($\gamma_1\delta\varepsilon$)*
Referent	The man *(abc)*	The lion *($c_1d\varepsilon$)*

The same process occurs in one illustration derived from the various Sanskrit words for the Sun. These words, which are all considered descriptive or metaphorical, have obviously formed the source of the following conventional terms for that Luminary, which occur in Indo-Germanic languages of more modern form:

Table 14

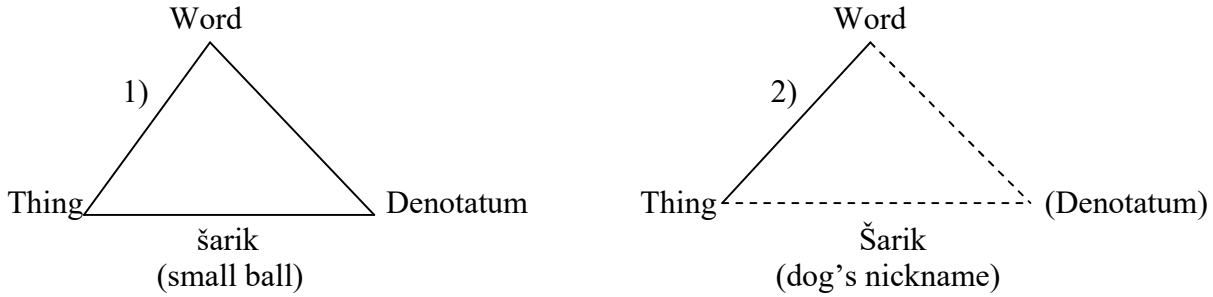
Sanskrit	**Persian**	**Greek**	**Latin**	**Germ., Eng.**	**Welsh**
Hailih	...	...	*Sol*	...	*Hail*
Hail-is	...	*He-elios*			
Sura	...	...	...	...	*Ser-en, a Star*
Sunu	...	...	...	*Sun, Sonne*	
Mibira	*Mibira*				
Af, Teb	*Af- tab*				

2.3. Thought-Symbol-Referent

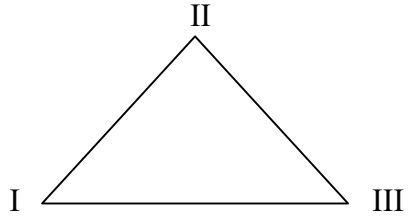
Mr Frege proposed two-coordinate logic for defining the function of designation within semantic categories "sense ← name → meaning". To such identification, Mr Frege came from the understanding of universal character of logic. While logic does not relate to a statement, i.e. to what this statement belongs in the real world, it is not necessary now to ask why this or that statement is true or false. It will be enough to introduce both degrees of truthfulness simultaneously. For Mr Frege, this philosophical conception is also caused by the other reasons.

Proceeding from syntactic grounds, Mr Frege makes the difference between an object and a function but combines altogether semantic category of a name and a statement. The statement is thus a *name*, which expresses a sense and thereby designates one of the degrees of truthfulness. As a name corresponds to an object, the value of a statement – its degree of validity – is also an object, which differs from other objects the same way as a real tree differs from that of abstract. Mr Russell drew a parallel between "proposition" and "statement", and Mr Carnap instead of "sense" and "value" used the terms "intensionality" and "extensionality". Such modification of Fregian semantics led Mr Russell to isolation of a statement from individuals, classes, etc. and thus to unclear definition of "propositional function".

If we compare three- and two-valued semantics, we will see that "sense" corresponds to "signification" and "meaning" to "denotation". At the same time, the process of abstraction mixes up in two-valued logic. The whole idea may be schematized thus:



In the first case, the sound or a hand-written word is linked with a thing – spheric and small – and with a concept of such a thing in which these two features are essential, i.e. sphericity and a small size; other features (colors, material, etc.) remain unimportant. In the second case, having become a proper name, or nickname of a dog, the word loses its connection with the former concept, but it has not possessed yet a link with a new concept *dog*. In general, Frege's triangle may be schematised as follows:

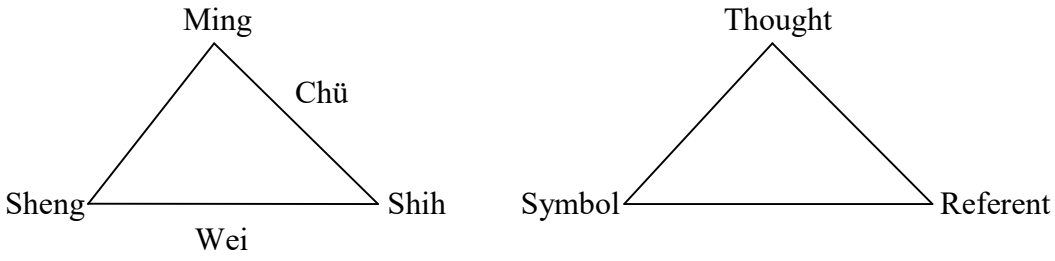


I. Object, thing, phenomenon, number, etc., i.e. *denotatum*
II. Sign: in linguistics, for example, a phonetic word or a written word, a symbol, i.e. *a name*
III. Concept of a thing, i.e. *designatum*, or a concept of denotatum.

This scheme, however, describes such common cases when the properties of a sign are represented with the maximum completeness as it often happens in the natural or artificial languages. But it is not a general case for semiotics. We then undertake the following. Between the elements designated by the numbers I-II-III, we find three relations: the relation II-I or sign – object (denotatum); the relation II-III or sign – concept (signification); the relation I-III (no general designation).

Relations between three elements I-II-III are considered differently in each certain area of knowledge. Semiotics appeals to remove all these restrictions and represent Frege's triangle homogeneously. For this purpose, it is necessary to find a new general term for the words *names, expresses, denotates, significates*. This term could be the verb *to possess*. Now we have to charactarise Frege's triangle ones again. From II to III, the signs "possess" the sense or signification; from III to II, the concepts (sense, signification) "possess" the signs; from II to I, the signs "possess" the objects or denotatum; from I to II, the objects "possess" the signs; from I to III, the objects "possess" the senses or concepts; from III to I, the concepts "possess" the objects.

The distinction between "sound-sense-meaning" can also be explained by the Neo-Moists' view. For them, all sounds ("sheng") are associated with "ming", but not with "shih", objects in the world. Therefore, we can only talk about the world, "shih", through "sheng" and "ming". If we consider "sheng" as a linguistic sign, it is possible to interpret "ming" as a Fregean "sense" and "shih" as "nominatum". Hence, "sheng" expresses "ming" and designates "shih". They give formulas for "wei" in general and "chü", "to denote", for avoiding errors.



This can be called the implicit ontology or ontological content of the Chinese language, which is revealed in a critical examination of the structure of Chinese.

2.4. Contextual Relationships

Meaning involves "a relation between a sign, that which the sign stands for (*referent*), and the *interpreter* of the sign. A meaning situation exists between the sign and that which the sign stands for. This will hold whether the connection or association exists (a) directly, between the sign and the physical response or action, or (b) indirectly, between the sign and referent through the medium of a mental response – a thought, idea, or concept". This explanation also holds for both natural and conventional signs, as Mr Brennan suggests:

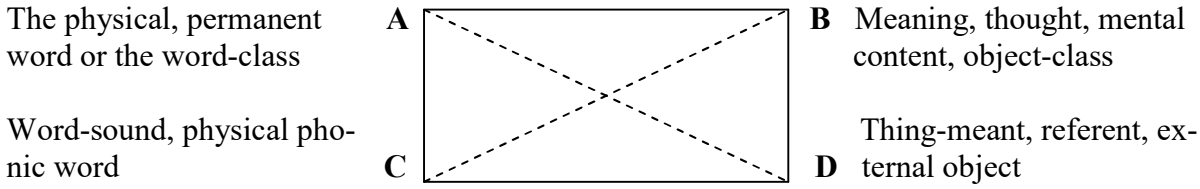
		Sign		*Referent*
A.	Natural	Red sky at night	means	fair weather next day.
B.	Conventional			
	1. Non-linguistic	Green light	means	go
	2. Linguistic	"Sanskrit"	means	ancient language of India.

Words are linguistic signs. Their meaning "involves the production in a person of some kind of connection between the word and the referent. If no such connection is produced, the word is meaningless to the person. We may say that nouns refer to things, adjectives to properties, and verbs to actions. But what manner of existence do these things, properties, and actions have? The referent of a word like "dog" seems to offer no difficulty. "Dog" refers to observable objects which barks, scratch, etc. The referent of a word like "proton" is not observable directly, yet it is assumed on the basis of inferences to have some sort of physical existence".

Direct Contextual Relationship

The relation between the linguistic sign and the extra-linguistic world may present various degrees of directness. Mr Gardiner has found that "to the child words have power; they are the effective means of getting in immediate and familiar touch with what they signify. The same condition obtains in the speech of primitive people. Through the names of things, they somehow take possession of the things themselves. For them speech is primarily part of the texture of the external world, and the sign becomes almost the equivalent of the real thing. They feel that they can control the world in which they live in proportion. Hence, the instinctive respect for verbal expression, the ritual and magic attitude toward words prevalent among primitive people". In Indian philosophical thought, which reflects an ancient character, the speech situation can be represented as a rectangle of direct relationships between a word and a meaning (see works by Mr Matilal, Mr Kunjunni).

Direct relation



The direct relation is only between A and B. The relations between C and D, C and B, and A and D are all indirect and imputed. In this diagram, the upper portion corresponds to de Saussure's analysis, and the portion ABD refers to the Ogden-Richard's triangle.

Indirect Relationship

In this attitude, Mr Gardiner proposes that "in direct sign contexts a certain phonetic stimulus immediately calls up an engram similar to that produced by the original perception of the thing signified; in narrative speech the mind merely "refers" to such a perception or thing. When we say, "A pine is a beautiful tree," the phonetic stimulus does not necessarily call up the engram of a particular visual experience of a

pine or of a tree; it is likely to cause simply a reference to them and to their relationship of subject and predicate. There are three terms in the makeup of such a context: the phonetic sign, which we now call “a symbol”, the reference, and the referent or that which is referred to.

A direct relationship between symbol and referent is realized in the case of onomatopoeias used in narrative speech. But here the directness is not the result of the absence of a reference; it is derived from a natural connection between referent and its phonetic imitation”.

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CHAPTER THREE
GRAMMAR

3.1. Logic of Grammar (I)

The grammars we have are filled with imaginary facts and false rules. We cannot know the true nature of things except by contrast and comparison. To this conclusion came some linguists, among whom Mr Sweet takes a special place: “The definition of the noun applies strictly only to the nominative case. The oblique cases are really attribute-words, and inflexion is practically nothing but a device for turning a noun into an adjective or adverb. Adjectives, again, embrace many words, which the grammarians ordinarily class as substantives and pronouns. In “cannon ball”, “cannon” is as much an adjective as “black”, and such pronouns as “some”, “this”, “that”, “one”, and the derived articles “the” and “a” ought really to be classed as adjectives. Even the distinction of gender in the pronouns is a mere accident of speech. The same word serves the agglutinative tongues for “he”, “she”, and “it”, etc.”

This problem presumably concerns the compatibility of logic, thought and languages of different types. In the Chinese language, the situation with logical thought differs from that of European more sharply. Compare results made by Mr Cheng:

I. Conjunction. We do not have correspondences to the conjunction ‘and’ in Chinese. Between the nouns, we use words *gen, torng, hann, yeu*. The predicates are joined together with expressions “yow…yow”, “bingchiee”, “yee”.

II. Disjunction. Russell denotes negation *no* and disjunction *or* as $\vee$ “if..., then” or $\supset$. Thus, $p \supset q \cdot = \cdot \sim p \vee q$ Df. (1). In Chinese grammar, everything is vice versa. Instead of saying “*p* or *q*” it is preferably to say “If non-p, then q”. For example, “Nii bu lai woo jiow chiuh” – “If you don’t come, I then go”. Instead of “or” in Chinese is also used the word *huohsh/huohjee*: “Huohsh nii lai huohsh woo chiuh” – “In one case I come, in other case I don’t” or $p \vee q \cdot = \cdot \sim p \supset q$ Df. (2), where $\vee$ = *huohsh*, $\supset$ – *jiow*, $\sim$ – *bu*.

III. Implication. The sequence “If..., then…” is expressed through the word *jiow* that is to be placed before the sentence, for example, “Tial hao woo jiow chiuh” – “Weather fine, I then go”. Lewis introduced the conception of “strict implication” for explaining of the paradox of material implication, i.e. the proposition “*p* strictly implies *q*” means that “It is not possible both *p* and *non-p* to be true” or $p \prec q \cdot = \cdot \sim \Diamond (p \sim q)$Df. (3), where $\prec$ is a strict implication, $\Diamond$ – “possible that”.

In common language, it is rather difficult to draw boundaries between these two implications. For Chinese it is not exclusion. If Mr. Wang insists on *p* to be false, he must then say: “If *p* is true, then my name is not Wang”, i.e. the falsity of proposition entails everything to be false.

IV. Necessity. Logical necessity was not an issue that preoccupied the ancient Chinese. Suppose all white swans die of white swan plague tomorrow: then it will be quite generally true to say that "All swans are black". However, this statement, though quite generally true, would be contingently, not necessarily, true. It just so happens that all the white swans have died.

In general, "pi" marks invariable truth in this world in descriptive sentences: "A man of moral charisma will necessarily (pi) be the author of sayings. The author of sayings does not necessarily (pi) have moral charisma. A benevolent man will necessarily (pi) possess courage, but a courageous man does not necessarily (pi) possess benevolence".

Thus, not all what is logically true can be rightly expressed by the language. Below we try to understand the reasons leading to manyfold conclusions. Grammar as an essential part of language does not always reflects mind's "expectations", especially in incorporated languages undergoing implicit character of sentence by its unseparatness.

3.2. Logic of Grammar (II)

In developed speech, one word fixes the form of another. The IE and the Semitic languages have both developed the characteristic grammatical device of the personal verb. The subject of the sentence, according to this structural plan, stands uniformly for something which or somebody who does something or suffers something. Whether action or suffering be involved is decided by two separate sets of formatives added to the verb, as, *pater* (*ama-t, ama-tur*).

Semitic logic recognizes no subjectless clauses; the inflection of the verb contains an implicit subject – what subject, is either understood from the context or from common knowledge. There is no actor but only an action, no one suffering but only a state, no formal provision is made. Here the compound meaning of these conjugational endings with its necessary implication of person and voice, and in the Semitic of gender also, interferes with the logic of the expression. True, of the "impersonal" verbs those referring to natural phenomena may have had originally a real subject, like Arabic *matarat as-samā'u, talagat as-samā'u*, "the sky rained, the sky snowed". But even in those cases there is no clear proof that the shorter *matarat* is really abbreviated.

Mr Scheffield says, "Word-elements and words serving primarily as signs that certain judgment-relations obtain between given ideas are called "relating elements": *as*, *of, to, since, if, and, shall,* write-*s*, *in* corpor-*e* san-*o*. It is necessary to define naming and relating features respectively as primarily symbols of ideas and primarily signs of sentence-relations, because while word-kernels may always be viewed by themselves as names, affixes and particles (that is, formatives, or simple affix-like words) are usually both naming and relating in their force, and one of these two features merely predominates. Thus *slave* is clearly a simple name; but *en-* in *enslave*

not only, like *the* in *the slave,* stands for an element of meaning, but makes *enslave* forefelt as a predicate term".

He continues, "Relating particles are peculiar in their meaning. A language, which expresses sentence-relations chiefly by relating formatives, has its words grammatically classed by these into the groups called "declensions" and "conjugations". In each group a set of formatives make up the "inflected forms" of one word, shown arranged as a "paradigm". Thus in *amā-rem* (*should love)* the formative expresses: (1) predication; (2) the person of the speaker; (3) the speaker's attitude toward what is said; (4) a distinction of time".

The preverbs or prefixes were also never considered independently meaningful. Their significance lies in the contribution they make to the meaning of the main verb to which they are attached. Sometimes they modify, sometimes they reverse the meaning of the main verb. For example, the root-verb *hr* means "to steal", but with *pra-* it means "to strike", with *ā-* it means "to eat", and with *par*i- "to abandon".

Mr Hirt lists simple elements such as *om, am, a, i, u, t, d, p, b, m, n, r, s, w* as the IE determinatives which were used in combination or alone to modify the meanings of root words. "At first," he says, "the meaning of the words was not essentially changed by the particles attached to them. Only conditioning relations of time and place were expressed. But gradually this sense was lost, and a new one was associated with the "suffix". Thus, for example, *-om* [Latin *-um*] became a sign of the neuter gender, *a* the sign of the feminine, and so on".

3.3. Logic of Grammar (III)

The subject of speech, if it is not expressed explicitly, must be present in a statement as psychological component. Mr Habelenz denotes "psychological subject" as a complex of imaginations, which appear in mind, and "psychological object" as a person, possessing these imaginations. For example, in Armenian the sentence is based upon a verb. The subject is a grammar person, but the predicate is the meaning of this verb. If I remember Tigran and his action "to move", I say "(He) comes". Psychological subject is not expressed with the word *he* but with grammar ending *-s*. However, this psychological statement is not equal to the full sentence "He comes". Psychological subject is the verb *to come* and the predicate is the name *Tigran*, which is supposed to be here. Thus, the full sentence "Tigran comes" is an expression with two different psychological statements: either "He comes" or "(He) comes".

In the Turkish linguistics, the situation is also full of surprises. Mr von Mises suggests, "There are two different expressions for "to be", one for the existential sense and one for the auxiliary verb. In the two sentences, "The room is dark" and "There is noise in the room" the "is" has to be translated quite differently. The expression for "being" in the existential sense is a verbum defectivum, which allows only the third person and only the present and perfect tenses. While in French the auxiliary verb *avoir* is used to paraphrase "being", there is no "have" at all in Tur-

kish. One has to translate the sentence “I have a book” by “There exists a book which is mine” (two words suffice for that purpose)”.

Some peculiarities of Western languages one can also find in Sanskrit whose system rests upon the objectivity rather than upon the subjectivity (see works by Mr Nakamura):

(1) In Sanskrit abstract nouns add suffix *-ta_*(f.) or *-tva_*(n.) to the root. These suffixes correlate with *-th* (Greek), *-tas* (Latin), *-tät* (German), *-te* (French), *-ty* (English) being close to them etymologically. In European languages, abstract nouns are seldom used. In Sanskrit, they are applied in common speech: “He becomes old” (“He goes to oldness”) – *vrddhatam* (“tvam”, “bhavam”) *gacchati*; “The fruit becomes soft” (“The fruit goes to softness”) – *phalam mrdutam* (tvam, bhavam mardavam) *yati*.

(2) European languages express individual peculiarities through an attribute or a quantity, in Sanskrit individual belongs to the abstract universe. Abstract nouns can be produced without limitations. Buddhist speculators define individual as *vyakti* with the meaning “thing-in-itself” – *svalaksana*, which is either a constant or a moment of situation in a very short period of time (*kincid idam* – “the hoc aliquid”). Mental constructions appeared later (kalpana, adhyavasaya). Such thought was inherent both to philosophy and to the language. In Sanskrit, the plural form of abstract nouns is common: *laksmyah* (happiness of a person), *kirtayah* (honor of a person). In Indian languages, there is sometimes no distinction between a noun and an adjective: *suhrd* (goodhearted, a friend), *tapana* (burning, the sun).

(3) It is considered the Indian thought to be agnostic because the universe is beyond the grasping of the mind. It reflects noun reduplication by negation, for example, “victory” and “non-victory” (jayajayau). Negative nouns are used for positive attributes: “non-grudge” (avera), “non-violence” (ahimsa).

(4) The Indians do not distinguish between the concepts *equal, similar, identity*, applying for these the statement *abhinna* (not different). The philosophers found later the words *ekatva, tadatmya, aikatmya* to define “identity”, “sameness”. Thus, the word *sarva* is used both in singular (each, every) and in plural (all) cases, although when the Indians intend to say “each”, they use the word *ekaika* or reduplication of the same word, for example, *vane vane* (in each forest), *dine dine* (every day), *yada yada* (whenever). Double form one also finds in Homeric epos, Gothic, and Celtic, but it does not refer to two different things but to their relation – *pitarau* – “father and mother”, “parents”.

(5) Minimization of individual as perceived essence is a tendency to such thought of the Indians by which all essences are pure illusions because only Universe is real. The statement “A is B” is simply logical step from illusion to more real Universe. For Dhamakirti in the statement “This is a tree because it is simsapa”, the main premise “All simsapas are trees” is analytic and the tree is an essence for *simsapa*. Thus, the tree refers to *simsapa* making relation of identity (tadatmya). Now common sense cannot establish this identity of *simsapa* with its predicates, but Buddhists apply any predicative essence to the all-embracing subject. Identity with the predicative fact means that the known represents itself, its essence (svabhava). Until

this essence of logical reason is inside the predicate, it will depend on it. Some features of this method of thought one also meets in grammar. First, the noun (or verbal noun) is used more often than the verb because the noun expresses more stable aspects of a thing. Second, the adjective, which modifies the noun, is used instead of the adverb.

(6) There are no adverbs in Sanskrit or the form of "accusativum cum infinitivum". Instead of it, one uses instrumental case because accusative case cannot express subjectivity.

Thus, the Western nations grasp a thing as an objective process, while the Indians do not prefer such thought, catching the subjective meaning because the world is inside the mind, i.e. in the language.

3.4. Logic of Grammar (IV)

In everyday speech, we often say, "I am", "Thou are", "He is". We mean the same as if we said "I is", "Thou is", "He am". The change of signs, however, indicates no change in the thing signified. It is often said that "he" and "I" are the nominative case of the pronouns. If this statement means anything, it can only mean that "I" and "he" differ from "him" and "me" as the Latin *ego* and *ille* differ from "me" and "ilium". "But this is quite untrue", supposes Mr Willis and adds, "If I say in English "Me loves he", I mean that *me* is the lover and *he* the loved. On the other hand, "Me amat ille" signifies that *me* is the beloved and *ille* the lover. Hence, it is untrue to say that *me* in English is the "accusative case" of *I*, since this can only mean that it bears the same signification as the accusative case bears in Latin, which is untrue".

The logical elements of a proposition must be carefully examined. With these the grammatical elements may or may not coincide. They rarely do so altogether. The most important difference takes place in one of the four ways, introduced by Mr Latham, which we summarize as follows:

"i. The grammatical expression may be more compendious than the logical one. In this way, we get the copula and predicate combined in a single word; or a verb instead of a participle and copula. *Fire burns = Fire is burning*.

ii. Grammar may express not only the logical elements of a proposition, but something besides them.

iii. Grammar may employ certain forms. The sign of the nominative case, where it exists, exists as a mark of distinction, not as the equivalent of any of the logical elements of a proposition. This is not the case with the *-o* in *voco* = "I call". The *-o* in *voco* stands as the representative of the subject, *I*, and as its substitute.

iv. Excess of Expression. In the word call-*est*, the *-est* is the sign of the second person. As such it is an equivalent to the personal pronoun "thou", the logical subject. Nevertheless, we say not simply *call-est*, but *thou call-est*, so using both pronoun and the substitute at the same time. This is an instance of what may be called "excess of expression"".

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CHAPTER FOUR
SYNTAX

4.1. Main Types of IE Simple Sentence

The study of the comparative-historical method of syntax is the most difficult, because syntactic phenomena are purely structural phenomena. Common features in different languages may be structural and material. Structural similarities also occur in unrelated languages; this is a typological similarity, e.g., in the Slavic and Kartvelian verbs there are forms of perfect and imperfect tenses, and the main means of formation of forms of perfect form are prefixes. However, this does not in any way indicate the relationship of these languages. A simple comparison of syntactic constructions of related languages does not always give an opportunity to restore syntactic constructions of the base language.

The main feature of the sentence is predicativity, i.e., in terms of logic – a certain reference of thought to reality, in terms of grammar – special grammatical categories. In IE languages, grammatical categories are modality, time, and person. They are enclosed in a predicate. Therefore, the predicate is a bearer of grammatical predicativity, the most important element in the sentence. The predicate with the subject constitute the centre and the minimum of the sentence, although the completeness of the expression often requires additional secondary members.

In IE languages, only the verb possesses the primordial predicative grammatical categories. The verb expresses not only the action or state, but also its predicative relation to the subject, and, of course, it was the main form of the predication.

The subject was expressed by a name or pronoun in the nominative as an independent form. It was not necessarily a noun. In modern IE languages, if an adjective is used as a subject, then it is substantive, but in the PIE, it may very well not have been necessary, because the difference in meaning between a noun and an adjective was smaller than at present. The predicate agreed with the subject in the number.

In modern IE languages, there are various cases when a sentence is without a subject and its predicative center consists of one predicate. Of these, only impersonal sentences expressing natural phenomena and physical or mental States of a person can be elevated to the base language, because these constructions coincide in almost all languages of this family and have an archaic character. This is most clearly the case with regard to sentences expressing natural phenomena.

The absence of a subject in these sentences can be explained by two reasons – either the subject of an action was thought to be of supernatural force, which was not indicated in speech and the subject was omitted here, or these structures was formed due to the model of personal.

The main types of ancient IE, or PIE, sentences are not directly observable facts, but a reconstruction of once-existing facts – the result of a comparative historical study. The main parameters of the sentence type are, firstly, its structural scheme (morphological form of its predicate and actants, first of all, subject and object, as well as the form of connection between them), and, secondly, its lexical entries (classes of lexemes, occupying places of a predicate and actants). Let us briefly dwell on some stages of the history of the question, more precisely, two questions – the reconstruction of structural schemes and the reconstruction of lexical entries, since the one and the other until recently were essentially unrelated lines of research.

As for the structural schemes of the sentence, as far back as 1901, Mr Uhlenbeck in the fundamental article "Agens and patients in the case system of IE languages" substantiated the thesis that the historically attested case system was preceded by another system in the PIE, with two main cases. Mr Uhlenbeck called them "assets" and "passives". "Active" was the case of the character, agent, i.e. case of subject with active verb. "Passive" was the case of a patient, an object with an active verb, and a subject with an inactive one (no matter the person or thing).

Mressr Uhlenbeck, Pedersen and other linguists of that time used the inappropriate term "transitional" verb instead of the term "active" and "intransitive" verb instead of "inactive". At present, it is generally accepted that the category of transitivity-intransitivity is typologically different than the category of verb-activity-inactivity, appearing historically in IE languages later.

In his reconstruction, Mr Uhlenbeck proceeded from the facts of morphology: in IE languages, nominative and accusative nouns of neutrum are the same in form in all numbers – singular, dual and plural. Therefore, it is suggested that these forms did not previously have a meaning of the nominative and accusative cases, but some more general meaning, namely, they were a "passive" case of agent. This assumption is supported by the fact that the stems of the nominative and accusative of the neutrum do not differ from the masculinum and femininum of the accusative. In other words, the ending *-*m* (*vŗkam*, Gk. *λύκον*) initially was not, apparently, the end of the accusative, since otherwise it would not be possible to explain its coincidence with the nominative and accusative of neutrum (*yugdm*, Gk. *ζυγόν*) Hence it followed the conclusion of the two plural PIE cases – "active" and "passive".

A good typological parallel to the IE language of the "Uhlenbeckian stage" is, in Prof. Stepanov's opinion, the Hurritan and Urartian languages. These languages are a late stage of the languages of the active order. Refusing to apply the term "ergative" languages to this type, some authors classify them as "fentive" or "fentive-ergative" type. In these languages, the subject of the transitive verb is formed by a special case (analogue of ergative); the subject of the non-transitive predicate, as well as the object of the transitive verb is a zero (absolute) case. This fact is particularly important as a typological parallel to the reconstruction of the IE accusative.

The reconstruction offered by us is not as far as possible when using the comparative method. Such a reconstruction was put forward in a number of works by Mr Gamkrelidze and Mr Ivanov. According to them, the PIE language is being restored as a language of the active system, possibly interspersed with ergative phenomena.

Conventionally, we call this distant stage the "Gamkrelidze–Ivanov stage". The stage we are reconstructing we call the "Uhlenbeckian stage" – the next in time, closer to the present, perhaps even the next one, not directly, but after some intermediate period. The content of the "Uhlenbeckian stage" coincides with the collapse of the active system, first of all the nominal and verbal classifications (taxonomies) and morphological features associated with it, and the beginning of the formation of the verbal voice and mood-temporal system of the Balto-Slavic and, apparently, the Greek-Aryan languages. A new order of languages is nominative-accusative.

All these terms are synonymous; however, some authors use the term "accusative languages" to distinguish languages with a specific organization of syntactic object, such as, for example, Uralo-Altai.

Being morphological, the reconstruction of Mr Uhlenbeck had important implications for the reconstruction of the PIE syntax. From it directly followed (by Mr Uhlenbeck not formulated) the assertion that at a certain stage there existed three different types of sentences.

In the modern approach to syntax, a sentence type is viewed as constituted by a) its structural scheme (model), b) its lexical entries, i.e. sets of words which may fill the slots for the subject, the object, and the predicate. Accordingly, the relationships between sentence types are defined whether by 'a', which is generally referred to as transformations, or by 'b', which the author calls paraphrases, or by both. The lexical entries and paraphrases in the ancient IE sentence are the main subject of this article. On these grounds, the structure of IE sentences may be shortly represented as:

Type I: Inactive subject + inactive verb;

Type II: Active subject + active verb;

Type III: Active subject + active verb + inactive object;

* Type IV: Active subject + verb + active object;

** Type V: Inactive subject + verb + inactive object;

*** Type VI: Inactive subject + verb + active object.

Type I: Inactive subject + inactive verb ("A stone is lying").

The function of 'inactive' means 'a thing', 'a body' or something similar. 'Active' (mobile) means 'a plant', 'an animal', or 'a person'. The predicates of the first type are verbs of *perfecta tantum*, the predicates of the second type are verbs of *activa tantum*. The predicates of the first type can mean both 'a condition of a body' and 'a condition of spirit'. The predicates are thus: 1) to be thrust, to stick out; 2) to burn, to flare; 3) to blossom, to be in bloom; 4) to be decayed; 5) to be dead; 6) to be arisen; 7) to be rough. These seven types correlate with primary names: 1) *δάος* 'torch'; 2) *πάγος* 'rock'; 3) *θάλος* 'escape', 'branch'; 4) σήψ 'a rotten wound'; 5) *όλοος* 'destructive', 'disastrous'; 6) perhaps, *όρνις* 'bird'; 7) *τράχων* 'a stony, rough country'.

Type II: Active subject + active verb ("A man is walking", "The wind is blowing").

Mr Delbrück found sixteen types of verbs of *activa tantum* (in the English translation): 1) to go 2) to bend, 3) to shiver, to be frightened, to escape, to run, 4) to creep, 5) to blow, 6) to leak, to expire, 7) to eat, 8) to drink, 9) to bite, 10) to spit out, 11) to vomit, 12) to fry, 13) to dry, 14) to give, 15) to live, 16) to be. Generalizing

this group of predicates, Mr Benveniste defined semantics of verbs as a process, which proceeds from the subject and develops outside. Moreover, Mr Benveniste assumed that in the IE languages 'to go' and 'to leak' represent a process in which participation of a subject is optional. Mr Stepanov draws here a parallel with impersonal sentences in Russian where there is no actant: *Segodnya žarko* ("Today is hot").

Type III: Active subject + verb + inactive object ("A man is laying down a stone").

Type IV, deficient: Active subject + verb + active object ("A warrior kills a fiend"). The IE *media tantum* are treated as synonymous with *activa tantum,* originally linked with the human subject exclusively. The overlap of the medium and perfect inflections is explained as a paraphrase of Type I and Type II in (originally) a small group of coupled verbs of body movements, e.g. 'to sit down' act.-med. *vs* 'to be seated' perf. (OInd. *šaye*, etc.).

Type V: Inactive subject + verb + inactive object ("The water breaks a house").

***

An agreement with the whole length of a sentence, in contrast to the "short agreement" within the syntagma (e.g., an adjective with a noun in gender or number), is a very important, perhaps the most important, feature that determines the formal unity of the sentence. This phenomenon in syntax has been already paying attention in the classical work of Mr Korsh where a typologically significant division of languages into two groups was proposed:

1) languages that connect parts of complex sentences primarily through the index of words (Eng. *that*),

2) languages using for this purpose mainly interrogative-relative words.

However, only in recent years the universal principle of "long agreement" started to develop, acting on the basis of the categories of certainty/uncertainty, the references, anaphora, etc., as well as on the role of the particles in this function. It was shown that logical words, including particles, have graduated in length (in the sentence) spheres of action. Also the localization function in connection with "long agreement" was investigated. All this makes it possible now to put the problem of syntactical agreement in a more general form.

The notion "agreement" is implicit in the above description of the main types of IE sentences. Since these types are established upon the compatibility of the name of a certain class with the verb of the corresponding class, so far as, obviously, between the name and the verb combined within the sentence there is a certain semantic correspondence in each type (for example, "activity", "inactivity"). This correspondence is in general the field of semantics. Therefore, Mr Stepanov calls "long component" of the sentence "semantic" in this sense.

The basis of semantic agreement in the final analysis is the correlation of predicate and actants of a sentence with extralinguistic entities; actants correlate with objects, and predicates with signs and relations of the same objects. Thus, there is a close relationship between semantic agreement within a sentence and its reference to the outside world. Semantic agreement and external reference are the same phenome-

non in two varieties. As we will try to show below, there is also a pairwise relationship between other (non-semantic) types of agreement and other types of reference.

There is another kind of agreement in the field of syntactics, which should therefore be called "syntactic". An example of it is the coordination by means of the so-called relative words such as Eng. *which*, *what*, etc., and also through the various kinds of anaphor type like IE **yo*. Of course, the syntactic coordination does not exist without some semantics, but it, in any case, does not consist in direct correlation with the objects of the external world. This type of agreement, like the previous one, is connected with some types of reference, primarily with the co-reference.

Finally, in addition to semantic and syntactic agreement, there is a third type – agreement within location. It is based on the correlation of the utterance and/or its individual elements with the participants of the act of speech – 'I', 'you', 'he' and through them with time and place of speech. This type of coordination, as mentioned above, is also associated with one special type of reference, namely, the reference to the persons participating in the act of speech.

The question now needs to be asked: what is the form of the long component, i.e. the form of agreement in the IE sentence?

If we remain in a limited area of semantics, it seems that the form of semantic agreement or semantic long component is not directly observable, that it is a pure grammatical convention (rule) of a given language. The speaker (and linguist) knows that the names of the active class must be combined with the verbs of the active class, but there is no formal similarity between the indicators of names and the indicators of verbs – some of them morphologically do not resemble the others. Classes of names and classes of verbs in this case appear to the researcher as "informative independent" from each other. Really, in modern IE languages, this is the case for almost all types of sentences. "The stone lies" and "A Man lies" apparently does not detect differences in their long components. These modern IE languages are fundamentally different from languages with consistent classes of names, for example, from Bantu. Here a certain indicator, usually a prefix, means a class of names, extending from this name – if it is used as a subject – to the entire sentence; in Swahili: *pa-hali ha-pa pa-dogo pa-zuri pa-ni-pendeza* "This is a small beautiful place I like" where *pa* is the prefix of the class of names denoting different places. Thus, the agreement in the Bantu is based on semantics.

The languages of the active system with respect to the form of agreement occupy an intermediate position between the languages of the class system of the Bantu type and the languages of such a system as modern IE. Classes of active and inactive names, as well as active and inactive (static) verbs, are deprived of their own indicators, but their belonging to a certain lexical class or subclass (the number of the latter can be very large) is revealed in the sentence and formally through the indicators acquired there by the given name and verb. In the languages of the active system, in which there are two – active and inactive – series of personal indicators of the verb, it is always possible to determine the subject of the active type of sentence: it is the name that corresponds to the active personal suffix of the verb-predicate. On the contrary, an inactive personal affix in the composition of the active verb-predicate word

form is correlated with the object complement (or the nearest object complement is incorporated into the predicate group without any indicator). This construction – with indicators of both subjective (subject-oriented, non-centric) conjugation and object (object-oriented) conjugation – is a form of "long agreement" in the languages of the active system.

Modern IE languages, as already noted above, in the sphere of semantic agreement seem to be amorphous, since the form of semantic agreement between the predicate and its actants almost knows no restrictions and is based on pure grammatical conventions such as the fact that (if, of course, to exclude metaphors) in the Russian language it is impossible to say **I am dark*, in English **I am raining*, etc. Nevertheless, this convention in the past was of a more definite character.

However, the IE technique of agreement is different from the technique of active and class composition. The agreement's indicator is not the own indicator of the verb or the actant, as in active languages, and especially not the indicator of the class name, as in class languages, but any external particle (such as Lat. *dum* – IE **-dṃ-*, Balto-Slav. *-si* – IE **seu̯*, etc.). This suggests that the method of agreement, similar to the method of active system (subject and object conjugation), in the IE languages is only a special case, adapted to some other, more general agreement technique (or, on the contrary, adapted it to itself). This IE technique is of a synthetic nature and should be considered separately.

It is simply a repetition of the same morphological element, which is quite similar to the corresponding phenomenon in the Bantu languages. However, here the nature of this element is unimportant: it can be morpheme-flexion, preposition-preverb, particle, pronoun or, finally, a full word – actant of the sentence. In order to achieve agreement, it is only important that this element is repeated in different parts of the sentence – in the subject group and in the predicate group; in the group of the name itself and in the group of its definition; in the protasis and apodosis of a complex sentence, etc. Thus, the elementary syntactic form of agreement is really of elementary – pictorial, iconic – character. An example in modern English is such cases as *in-cut in...* by a simple verb *to cut*. In Latin, it is agreement of a noun with an adjective: *hort-us bon-us* 'good garden', *puell-a bon-a* 'good girl'.

Changing its position in the sentence, such a detachable element is included in different paradigmatic classes (different "parts of speech"), but its fixation in a particular class is obviously the latest. An example is a particle **per*, occurring in different syntactic positions, as enclitic, then as a preposition-preverb (although it is impossible to agree that they are two distinct IE word).

In addition to the repetitions of particles, it is also widespread repetition of full-meaning words – the actants of the sentence (paronomasia). This type of repetition usually serves as a connection not inside, but outside of a simple sentence, combining several simple repetitions into one complex. In this variety, IE repetition merges with repetition as a universal syntactic means of communication, presented in the languages of different families.

Location agreement is in all types of agreement – in repetition of some elements in different parts of the sentence. But the repeated indexes here are the pointers of the

place and time of the statement “I – here – now”, “you – here – now”, “he – there – then”, i.e. different deixis. In modern IE languages, the repeated element is usually heterogeneous members of the synonymic series, for example, ‘I’ in the group of subject + morpheme of 1st p. sg. and Present Tense in the verb-predicate + ‘here’ in the group of adverbial modifier of place + ‘now’ in the group the adverbial modifier of time. In ancient IE languages, a repeating element is often a special deictic particle.

On the Semantic Structure of the Balto-Slavic Sentence

By matching element pertaining to the reconstruction of syntagma and paradigms, Mr Stepanov proposes the following hypothesis. Proto-Balto-Slavic had two types of syntagms or simple sentences: 1) a type comprising combination of animate noun and verb taking the corresponding “animate” diathesis, in other words, the type characterized by the “prolonged” semantic component “animateness” throughout the sentence, 2) the other type comprising the combination of inanimate noun and “inanimate” diathesis verb, that is, the type with the “prolonged” semantic component “inanimateness”. Primary Balto-Slavic sentence types were:

Type I	Inanimate entity acts passively (closing the action in itself), stems like *link-*. Secondary types arise after the loss of semantic concord relating the noun and the verb.
Type II	Animate entity operates actively upon a certain object, stems like *lenk-*.
Type Ia	Inanimate entity acts passively (closing the action in itself), *liñkti, linksta* “bends down (by itself)”
Type Ib	Animate entity acts like inanimate entity or Inanimate entity acts like animate entity, based on type-I stems, e.g., *linkėti, linki* Somebody bows, expressing his best wishes, and also *byrėti, birenti* (with *berti – birti*).
Type IIa	Animate entity operates actively on a certain object, *lenkti, lenkia* “bends something”.
Type IIb	Animate entity acts passively (closing the action in itself), *lenktis, lenkiasi* “bends down (by itself)”.

This line of development can be paralleled by Greek analogies (in the ablauting class) and in part by Hittite analogies, that is, by the correlation of active verbal diathesis and nominal “animate” type.

4.2. IE Simple Sentence: Type I

As mentioned above, the minimal class of predicates in this type is reconstructed by Mr Stepanov as lexemes corresponding to Homer’s *perfecta tantum* with the meaning “state of the body”. The main semantemes are as follows:

1) ‘to be stuck’, ‘to hang around’: Gk. *πέπηγε, πάγος* (m.) ‘rock’, Lat. *pepigit, pāgus* (m.) ‘milestone’, ‘boundary column’;

2) ‘to burn’, ‘to glow’: *δέδηε*, Sans. *dagdhá-*, Lith. *dega*;

3) ‘to blossom’, ‘to be in bloom’: *τέθηλε*, pres. *θάλλω*, Armen. *dalar* ‘greens’, ‘grass’, Alb. *dal* ‘grow’; the presence of primordial presence in this Greek root does not contradict its consideration in the group of *perfecta tantum*, since this presence has the status of the semantic branch of the perfect;

4) ‘to be rotten’: *σέσηπε*, root *σᾰ̆π-*, due to the root with a short *-ᾰ̆-*, probably related to Lith. *šiùpti šiumpa šiùpo* ‘to rot’, ‘decay’;

5) ‘to be dead’: *ὄλωλε*, *(δι)έφθορε*;

6) ‘to be arisen’: *ὄρωρε*, Hett. *ar-* ‘arrive, reach’, Lat. *orior* ‘rise’, ‘arise’, ‘come from something’, Skr. *ṛṇoti* ‘rises’, ‘moves’; in some languages, affixed verbs from this root have an active meaning: Hett. *arnu-* ‘bring’, ‘deliver’, Gk. *ὄρνυμαι* ‘rush’, Lat. *ruo* ‘destroy’;

7) ‘to be stormy’: *τέτρηχα*, Pres. secondary *τᾰ́ρασσω, τᾰ́ράττω* ‘stir up’.

In accordance with the indicated verb roots (1)-(7), there are primary names: 1) *δάος* (n.) ‘torch’, 2) *πάγος* (m.) ‘rock’, *πάγη* (f.). ‘trap’, 3) *θάλος, -εος* (n.) ‘escape’, ‘branch’, *θάλλος* (m.) ‘the same’, 4) *σήψ, -πός* (f.) ‘rotten wound’, *σαπρός* ‘rotten’, 5) *ὀλοός* ‘destructive’, ‘disastrous’, *οὖλος* ‘disastrous’, ‘sinister’, 6) there are no specific names, but perhaps you should put here *ὄρνις* (f.) ‘bird’, *ὄρνεον* (n.) ‘the same’, 7) *τράχων* ‘rocky terrain’.

The general semantics of this whole group of verbal and corresponding nominal roots – “condition of body” – responds well to modern linguistic ideas about the nominal origin of the Perfect from the predicates of nominal sentences. The traces of this origin are preserved in the most ancient meanings of Perfect forms; cf. Gk. *τέτοκα* is applied only to a woman ‘I gave birth to…’, in contrast to the forms of Presence and Aorist *τίκτω, ἔτεκον* applied to beings of both sexes. If the Perfect had not originally had the meaning of “state of body”, then such a restriction of use would be inexplicable.

The Greek *perfecta tantum* also includes several lexemes with the meaning of a certain state as a constant quality: 1) ‘to be similar to’: *ἔοικα* without correspondences outside the Greek; 2) ‘to be ordinary’: *εἴωθα*, Ind. *svadhā* ‘habit’, Goth. *sidus* ‘custom’, Lat. *sodalis* ‘ally’.

The third, quite extensive, group of Homer’s *perfecta tantum* consists of lexemes with the meaning of the impact on the senses and semantically related imitatives of the verbs: 1) *ὄδωδα* ‘smell’, 2) *βέβρυχα* ‘groan’, ‘roar’, 3) *μέμυκα* ‘moo’ and the like.

In separate IE languages, corresponding semanthemes and lexemes are reflected as small compact groups of verbs with anomalous paradigms, most often as Presence Perfect.

In German, this is a group of Presence Perfect, more precisely, a part of this group, semantically and etymologically corresponding to the lexemes with the meaning “condition of body”: Goth. *aih* ‘own’; Goth. *skal* ‘must’, cf. Lith. *skolà* ‘duty’; Goth. *daug* “useful”, cf. Lith. *daūg* ‘many’. The other part of the German Presence Perfect is verbs with the meaning “condition of mind”.

A special group of Homer’s *perfecta tantum*, which at first glance cannot be associated with a group of predicates of type I, “condition of body”, but which ulti-

mately reveals its connection with the latter, constitute lexemes with the meaning of mental states of a person, “condition of mind”:

1) ‘to rejoice’: *γέγηθα*, Lat. *gaudeo* ‘the same’; ‘fear’: *δείδια*, cf. Armen. *erknč^{c}im*, aor. *erkeay*; Skr. *dvéṣṭi* ‘hate’, perhaps also Lat. *dirus* ‘sinister’;

2) ‘to see’: *δέδορκα* with the submeaning of the intensity of the process; Skr. *dadársa*, ‘I saw’; Old-Irl. *ad-con-darc* ‘I saw’, Goth. factual verb *ga-tarhjan*, Anglo-Sax. *torht*, Old-Germ. *zoraht* ‘clear’;

3) ‘to marvel’ – *τεθηπα* - *θαμβός* Homer. ‘stupefying’, perhaps akin to Goth. *dumbs*, ‘dumb’;

4) ‘to think about smth.’: *μέμονα* ‘think hard’, ‘want’, ‘seek’; Lat. Perfect with the value of the Present *memini* ‘remember’; Goth. Presence Perfect *man* ‘think’, ‘believe’, *ga-man* ‘remember’;

5) ‘to believe’, ‘trust’: *πέποιθα*, Lat. *fido* with the Perfect *fisus sum*; Goth. *beidan* ‘wait’, *baidjan* ‘convince’, Alb. *bé* ‘oath’, Rus. *beda*;

6) ‘to hope’: *ἔολπα*, Lat. *uolup* ‘pleasant’, cf. (n.) adjective; *uelle* ‘desire’, Germ. *wollen*, Lith. *viltis* ‘hope’, etc.;

7) ‘to know’: *οίδα,* Skr. *véda* etc.

Many of the lexemes in both of the main groups of Homer’s *perfecta tantum* – “condition of body” and “condition of mind” – have a morphological feature – the absence of *-o-* step in the root. The same peculiarity characterizes the lexemes with the meaning of sound transmission – *βέβρυχα* ‘groan’, ‘cry’, *μέμυκα* ‘mumble’, ‘roar’, *μέμηκα* ‘shout’, ‘bleat’, *κέκλη*, ‘cry’. The lexemes without *-o-* at the root form the most ancient type of the ancient Greek Perfect. With this observation, it is necessary to link the conclusions of Mr Bader and others on two morphological types of IE Perfect: one with vocalism *-o-* without doubling, the other with doubling without vowel gradation with zero vocalism. Different IE languages often retain these two types of Perfects. The marked features are morphologically bound, probably, with some features of semantics. As Mr Pulleyblank showed, the *-o-* at the Perfect root is semantically significant with the meaning “direction of action inwards” (introvert). Apparently, the opposed morphological feature – the absence of *-o-* – must also be significant, although today we cannot yet fully characterize the corresponding meaning.

Typological parallels to PIE Perfect can be found in different languages, for example, in Afro-Asiatic languages of the so-called active type. Such parallels are the class of static verbs, opposed to the class of active verbs; the sentence structure corresponds thus to this division.

According to Mr Klimov, the class of static verbs consists mainly of verbs expressing physical state. In some cases, they may also appear in subject from of the active class; therefore, in some American works, they are called “neutral” verbs. These include lexemes of such semantics as “hang”, “roll”, “fall”, “stick out”, “to be high”, “to be long”, “to be big”, “to be clean”, “to be heavy”, “to be green”, “to be raw”, and in general all quality verbs whose meaning in the languages of the nominative-accusative structure is conveyed by the combinations of the verb “to be + adjectives”. It is obvious that the class of the static verbs of the languages of the active system as

a whole corresponds to the groups “condition of body” and “constant quality” in the archaic Perfect (or *perfecta tantum*) of IE languages.

4.3. IE Simple Sentence: Type II

According to Mr Stepanov’s hypothesis, the predicates of this type of sentence are IE verbs of *activa tantum*. Mr Delbrück outlined this group based on coincidence of two languages – Greek and Old Indian (Sanskrit and Vedic). According to Mr Delbrück, this includes the following lexemes (semanthemes):

1) ‘go’: *jigāti, βαίνω* and *βάσκω*, cf. also *jasaiti*, Skr. *gáchati* ‘come’; 2) ‘bend’: *bhujati, here φεύγω* ‘run’, the semantic relation between ‘bend’ and ‘run’ remains unexplained; 3) ‘tremble’, ‘scare’, ‘flee’, ‘run’: *trásati, τρέω* 4) ‘crawl’: *sárpati, ἕρπω*; 5) ‘blow’: *vāti*, cf. Rus. *veyat*’; 6) ‘flow’, ‘expire’: *srávati, ρέω*, cf. Rus. *struya, ostrov*; Lith. *srutà*, more often only in pl. *srùtos*; 7) ‘eat’: *átti, ἔδω*; 8) ‘drink’: *pibati, πίνω*, not quite identical with *pibati*, but going back to its similar form; 9) ‘bite’: *dáṣati*, *δάκνω*; 10) ‘spit out’: *ṣṭhivati, πτύω*; Lith. *spiauti, spiauna* ‘same meaning’; 11) ‘spew’ (vomiting): *vamiti, ἐιέω*, cf. Lith. *vémti, vemia* ‘the same’; 12) ‘fry’: *bhrjyáti, φρύγω*; 13) ‘dry’: *óṣati, εϋω*; 14) ‘give’: *dádāti, δίδωμι* 15) ‘live’: *jivati; ζάω, ζώω*; Rus. *zhit’*; Lith. *gýti, gyja* ‘heal’, ‘recover’, *gývas* ‘alive’; 16) ‘be’: *ásti, εἰμί*; the primordial affiliation of the verb ‘to be’ to the group of active verbs is currently questioned and, apparently, it originally had a medial inflection.

Contrary to the author of this classification Mr Delbrück, as well as Mr Benveniste, for this semantically diverse group made some semantic generalization: here we have verbs with the meaning of movements and basic life manifestations of “active entities”. Especially, this generalization fully corresponds to our typology of sentences.

Mr Benveniste, as you know, proposed another generalization: “In Active Voice, the verbs mean the process that emanates from the subject and develops outward. In Middle Voice, which is diathesis, defined through opposition from the first, the verb indicates the process that develops in the subject; the subject is internal to the process”. It is unlikely that this generalization can be described as semantic one. Compare also that doubt expressed by Mr Perelmuter: “It is impossible, however, to exclude completely the possibility that the relationship we formulate has merely a syntactic character; that the phrase “action within the subject” is in this case a purely verbal transposition into the semantic area of a syntactic phenomenon of intrasitivity. But, whatever this generalization of Mr Benveniste was – syntactic, semantic or semiological – it is difficult to agree with it: if you can still imagine the processes of “blow”, “flow”, “spit out”, etc., as “proceeding out of the subject”, then the attributing this feature to “go”, “eat”, “drink”, etc., is impossible do done.

Mr Stepanov agrees with Mr Benveniste in the sense that all these verbs can be transformed into transitional, object verbs. But for this generalization, the well-known term “transitivity” is more appropriate. However, another feature of *activa tantum* was noted by Mr Benveniste successfully: “In IE languages, “to be”, as well

as “to go” and “to flow”, is a process in which the subject is not necessary”. Indeed, the actions mentioned in the *activa tantum* group are permanent, generic characteristics of active entities, independent of their willpower: to be what they are, they must “live” , “walk” (or “crawl”), “flow”, “blow”, “burn”, etc. The “wind” is that which “blows”, the “water” is that which “flows”.

Another characteristic of this type of sentences is the distinction between truly active entities and non-trully active entities. To a certain extent, this semantic-syntactic distinction corresponds to the morphological difference between the two types of subject’s names, discovered by Mr Benveniste. While the names on **-tor* denote the doer in the true sense of the word, the doer-maker, the “author”, the names on **-ter* denote the doer-performer, “agent”, “tool”. It follows, further, that the names of active entities of the type “fire” as an active principle are opposed to inactive fire.

4.4. IE Simple Sentence: Type III

For this type of sentences, two sources are to be reconstructed with the same probability, which may have acted simultaneously (just as two independent etymones are often found in the etymology of one word).

The first path is from the Ist (inactive) type of sentences. It is being reconstructed (in a different context of reconstruction) by Mr Gamkrelidze and Mr Ivanov as follows. If the PIE language at the most ancient stage was the language of the active system, then a sentence like “A person puts a stone” should have specific features in it. Since here the actant-subject is active and the actant-object is inactive, the structure of the predicate – in the typological correspondence with the structure of sentences of this type in active languages – should contain an indicator of an inactive actant, an object. This indicator, according to the reconstruction of Mr Gamkrelidze and Mr Ivanov is the element *-e*, the same one that acts as an indicator of the predicate (both the predicate-verb and the predicate-name) in the type of the sentence “The stone lies” (in our classification, in type I). Later this indicator became a flexion of the 3rd p. sg. of Medio-Perfect and entered into a number of inflections of the Perfect. Thus, from the point of view of this reconstruction, it should turn out that the sentence of the type “A person puts a stone” develops from the type “A person a stone lies”, and this last one of the type “Stone is lying” – through the introduction of an aquanthus-subject. This path can be called the development “from within a sentence”.

There are, however, grounds for suggesting a second way for the emergence of the type III sentences “A man puts a stone”, – “from outside a sentence”, that is, from a combination of two simple sentences in the text into one complex: “A man puts” (I active type sentence) + “The stone is lying” (II inactive type sentence) – “A man puts a stone” (III type sentence). We will call this way “serial” due to its typological similarity with the well-known language constructions of Southeast Asia languages. So, for example, in Vietnamese: “break the cup”: beat + break, be broken + cup (dánh + vo + chén); in the Akan language: “pour grains into water”: carry + pour + grain + swim (ke + fe + kwe + ok), i.e. “I pour grain” = “I pour + grain floats”.

Regarding the very term “serial construction”, it should be noted that many researchers apply it restrictively: only to single-subject series in African languages, such as “I carry” + “I pour”; but there is no reason for such a restriction. IE analytical causatives of the French *laisser tomber* are of this type too “drop” = “allow” + “fall”.

Immediate traces of this path of development are observed in type IV of IE sentence. The presence of such a path forces us to assume the Baltic diathesis of the verb of the most archaic type, i.e. the development of paired verbs from the same root with ablaut alternations. Compare the above example: *Bemas merkia* (a verb of active or active-causative diathesis) + *Linai mirksta* (a verb of intransitive, inactive, medial diathesis) – *Bérnas merkia linùs*.

In this case, the development of an inactive actant-object initially had to adjoin the verb-predicate of the active sentence. This path (as well as the indicated “first” path from the reconstruction by Mr Gamkrelidze and Mr Ivanov) also finds typological parallels in the languages of the active system. In these languages, in such sentences as “The dog has bitten a snake”, the subject will be the name corresponding to the personal affix of the active class in the verb-predicate, i.e. “dog”; on the contrary, the name of the nearest object, i.e. “snake”, is incorporated without an indicator into the predicate. This type of sentence corresponds to the “second” path of IE sentence development. But in the same languages of active type the sentences of the same nature can be made differently: the closest object, here ‘the snake’, corresponds to the inactive affix of the verb-predicate in the word form of the active verb. The latter type of sentence corresponds to the “first” path of the IE sentence.

All these observations, in particular the “second” path, allows us to take two-diathesis verbs with the diathesis active-media verb as the historically primary type of predicates in the sentences of the type III (“A person puts a stone”).

4.5. IE Simple Sentence: Type IV

The semantic (non-grammatical and non-lexical) example of this PIE type of sentence is “Man, the warrior, kills the enemy”. But it puts the researcher in front of many difficulties. At first glance, it may seem that the reason for these is that the designations of active entities, such as “man”, “enemy”, etc., as objects in the sentence, are either out of linguistic phenomena covered by the reconstruction of Mr Uhlenbeck, or their distribution within its framework is unclear. Indeed, for example, the stems on *-o* often belong to the names of the inactive class, cf. **pedo-* ‘footprint’ with the name of the active class **ped-* ‘foot’. However, on the other hand, the names of the animals of the active class of the type ‘wolf’ are also of the primordial stem on **-o*. The position of the stems on **-a, **-e* (particularly in Balto-Slavic), etc., is also insufficiently covered in this respect. The composition of the active class of names, its subclasses, segmentation, etc., as already mentioned above, has not yet been sufficiently studied.

Nevertheless, during the reconstruction of the sentence, these difficulties could be circumvented, since for reconstruction it was enough, as already shown, to have

"minimalized" lexical entries. In this case, one would deal with lexemes that obviously belong to the stems on *-*o*, for example, the "wolf", or to the class of objects that a person is able to actively influence, for example, "kill". Then the existence of a sentence of type IV (limited in this sense) should not be in doubt.

In the written IE languages, the name in the object position is formed by the accusative form (form on *-*m*), regardless of whether the name belongs to the active or inactive class - in all stems on *-*o, *-ā, *-ē*, partially in stems on sonant and consonant of the type **ped*-, as well as in suffix stems on *-*ter*//*-*tor*//*-*tṛ*, etc. Meanwhile, in the reconstruction of Mr Uhlenbeck, the indicator *-*m* can be attributed only to the agent, i.e. to an inactive name in the position of the subject (in sentences of type I) and the object (in sentences of type III). As for the active name in the object's position, it would have to acquire the form of an agent, but the latter, as already mentioned, is a form of inactive names.

The question arises: "In what form could the actant "------ the enemy" (active name in the position of the object) exist at this stage?" The answer to this question remains unclear. Mr Gamkrelidze and Mr Ivanov introduce a special concept "structural and syntactic inactivation", in contrast to "primary, lexically defined inactivities with permanent markers of inactivity". "Structural and syntactic inactivation" is a (supposed) form in which the name of a lexical active class (for example, 'man', 'beast'), permanently marked with an activity indicator, could appear in a sentence in the position of an inactive actant – object, agent. Such a syntactic form cannot be its own form of this name, which prohibits its appearance in the position of an agent. This form cannot be a form of the case on *-*m*, since the latter is formed in the framework of the nominative-accusative structure of the language. What could be such a form?

Mr Stepanov sees only one, very distant parallel to the desired form – the Hittite names on -*ant*-. They are derived from the names of the neutrum (similar to the inactive class), which cannot appear in the subject's position by the transitional verb, i.e. in sentences like "Water destroyed the house". However, the derivative names on -*ant*- are not subject to this prohibition and may appear in this position, i.e. become "structurally syntactic entities" (for example, *u̯etenant*- 'water' active while *u̯atar*-//*u̯eten*- 'water' is inactive). However, in reality, we do not find any IE forms that could be directly associated with such actants as "------- the enemy" in type IV. Thus, paradoxically, it turns out that the type IV of sentence "Man, the warrior, kills the enemy" could not exist at the "Uhlenbeckian stage" and obviously could not exist at the earlier stages of the PIE language despite their reconstruction in the work of Mr Gamkrelidze and Mr Ivanov.

The conclusion is that the transformation of the language of the active system where there are no type IV of the sentences like "The warrior kills the enemy" with the morphological design of the active object and the corresponding predicate verb, into the language of the nominative-accusative system, where such sentences are typical, was associated with certain difficulties. They were resolved in various ways:

1) by lexico-semantic derivation “from gesture to act” in all languages by the universal nature of taboo and euphemism: Lith. *mušti-užmušti*, Old Ind. *kṣa-* ‘harm’, ‘injure’ in accordance with Gk. *κτείνω* ‘kill’, etc.;

2) by preserving syntactic causatives, “supplicate passive”, especially in Greek and Hittite: *θνήσκει ὑπό τίνος* “He dies from the hand of (somebody)”, “He is killed by someone”;

3) by morphological derivation;

4) and, most importantly, by associating the type IV with the type III.

4.6. IE Simple Sentence: Type V

Mr Stepanov considers this type of sentence only related to the question of special occurrences of names like “water”, “fire”, “wind”, etc. If, as is reasonably assumed, PIE was the language of an active system, then there existed a binary separation of names into “active” and “inactive”. This simple and clear correlation is entirely attributed to such names as ‘water’, ‘fire’ and some others. It is supposed that there were at least two names for each of these entities – one designated it as an active life force, in particular a deity: roots **ṇgni-* ‘fire’ and **āp-* ‘water’; another – as an inactive thing: roots **wed-//*ud-* ‘water’, etc. This assumption goes back to the idea of Mr Meillet about the double EI names of ‘fire’ and ‘water’, expressed out of connection with the concept of active order, but in connection with his theory of IE grammatical gender. Mr Meillet counted the names of masculine gender primordially belonging to the “active” gender, and the names of neuter belonging to the “inactive” gender. Mr Schulze showed, however, that the gender relations in the names of water and fire underwent numerous reorganizations without any relation to “activity-inactivity”, so that the gender indicators in solving our question cannot play significant roles.

Let us return to the original position on the active structure of the PIE language. Here, however, many problems arise. If the overwhelming majority of names are classified in every language of active order into two named groups, then the concepts of water, fire and under are two different concepts and different semantemes, united only in the representation of a modern linguistics. Or is there before us some special phenomenon that falls out of the system of the active-order language, since in this case there is some generalizing concept, like a “hyper-lexeme”, represented by two sharply different words and concepts – one in the active and the other in the inactive class?

Our hypothesis is as follows. Words like *water, fire* and similar, like all the names of things, belonged originally to the inactive class, and their duplicity is a more recent phenomenon caused by various reinterpretations from the point of view of language, perhaps that names like *water, fire* are associated with predicates and probably even extracted from different predicates – the “active” name from the “active” predicate, the “inactive” name – from the “inactive” predicate.

The initial observation is that in all IE languages the elements and the names of "human elements" – *dream, work, service, war*, etc. – are included in tautological phrases based on the principle of figurative etymology or paronomasia. Some of these names are "eliminated" and "recoverable" subjects of impersonal sentences, the others are the same objects (Lat. *pugnam pugnare*), the third are objects but with a neutralized form of the subject-object, i.e. "nominative" = "accusative", like Rus. *rabota rabotat'* instead *rabotu rabotat'*.

The material presented here suggests the existence of special verb-nominal tautological syntagm combinations in the PIE language, with an unfamiliar form of the object or subject. The semantics of such combinations probably reduced to the designation of elements, such as "(Grom) gremit". It can also be assumed that these phrases were distributed in the language into two classes. In one class (II active type of sentences), the name took the position of a subject or instrumental actant with the same verb – "Veter veyet". In another class (III type of sentences), the name occupied the position of the nearest object also with the verb of the same root, in other words, syntagmas like "voevat' vojnu" with effective transitivity and "analytical" direct object. It can also be assumed that the names of "active" class were extracted from tautological combinations corresponding to the type II of sentences, while the names of "inactive" class are extracted from combinations of type III sentences like "Man makes fire".

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PART III
LINGUISTIC NATURE OF REALITY

CHAPTER ONE
LANGUAGE AND METHOD

1.1. Knowledge (I)

School philosophy proposes seven types of relations between subject and reality: realism, idealism, dualism, identity, hyperrealism, solipsism, and skepticism. These relations are composed as a complex of knowledge, which is the basis of sentences in which we believe. The faith is, however, not a mental act but disposition of the form: "If someone believes in the sentence *S*, then the probability of one's behavior is *p*". The task of logical cognition is here to find and analyse the procedure of X's ability to connect the significance of *p* with the sentence *S* at the moment *t*. Now we must accept that the probability plays an essential role in logic of knowledge. But the result of each test will be either visual, or acoustic, or tactile, or mnemonic.

It is a widespread principle that sensations are the basis of our knowledge. Realists do not take into consideration that human abilities to perceive are limited. They also neglect the fact that if a general statement $\bigwedge x(x \in F)$ is universally valid for singular sentences 'a∈F', 'b∈F'..., the reverse process will be logically impossible. And such philosophers as Mr Kant suppose that we do not cognize through perceptions at all, because if we exclude the subject of perceiving there will be nothing referring to perception. Mr Kant says, "That bodies are extended is not an empirical judgment but a proposition which stands firm *a priori*... I can cognize beforehand by analysis the conception of body through the characteristics of extension, impenetrability, shape, etc., all of which are cogitated in this conception. Now I extend my knowledge and, looking back on experience, from which I had derived this conception of body in the first place, I find weight at all times connected with the above characteristics, and therefore I synthetically add to my conceptions this as a predicate and say, "All bodies are heavy".

In Kant's opinion, "what one understands by a "body" is definitely fixed from the start. Somehow it was decided by the nature of our mind that the properties of extension, impenetrability, shape, etc., belong to the concept *body,* i.e., to the entity denoted by this word of our language, but that the property of weight does not belong to it (although all bodies, according to Kant, are heavy). Kant does not seem to have realized that one could as well use a different meaning of the word *body*. The concept *body* is, in Kant's opinion, "abstracted from experience" and unambiguously determined. In the last analysis, this expresses an old idea dating back to Aristotle, according to which one can assign to every noun a "definition", which discloses the "essence" of what is denoted by the word".

Intuitive definition of Kant's analyticity results from those propositions, which are true by any state of affairs. This idea was proved by Mr Leibniz and based upon

the necessary truth in all possible words. But the language regulates the state of affairs differently and we enable to derive at least three definitions of analyticity that throws back Kant's speculations (see works by Mr Marciszewski):

"(I) The sentence is *analytical*$_1$, if it is a logically valid statement or its substitution. Ex.: (i) p&q⊃p; (ii) "For every *x*, if *x* is a celestial body rotates around the sun, then *x* rotates around the sun"; (iii) (x)(Px⊃Qx)⊃((x)Px⊃(x)Qx).

(II) The sentence is *analytical*$_2$, if it is *analytical*$_1$ or its consequence. If the word *planet* is synonymic to the phrase "a celestial body, which rotates around the sun", the sentence (ii) transforms into that of (iv): "For every *x*, if *x* is a planet, then *x* rotates around the sun" or "Every planet rotates around the sun". The sentence (iv) is *analytical*$_2$ but not *analytical*$_1$.

(III) The sentence is *analytical*$_3$, if it is a postulation of meaning or its consequence. Ex.: (v) p&q⊃p (the postulate of sentential logic); (vi) x=y⊃y=x (the postulate of the theory of identity), (vii) "If *x* is a part of *y* and *y* is a part of *z*, then *x* is a part of *z*" (the postulate of mereology)".

1.2. Knowledge (II)

In the XXth century, linguistics extended its ontological status thank to the natural sciences. Psychological analysis became the mainstream by the physical description of the world. Many philosophers unified with the problem of the "world construction" through the language succeeded in methodological issues of different sciences. From language entities – phonemes, lexemes, morphemes – linguists passed to a more extensive class of propositions and their functions. It was obvious that the structure of language is capable to give the answer to many questions about the "real" world. The linguists also achieved considerable success in the solution of important methodological problems of science. The principle of correspondence "language – reality" can freely begin with sound complex. Indeed, for the description of the world we use not sounds, morphemes, or lexemes, but propositional functions. There are two ways of world description – that of Mr Russell and Mr Wittgenstein:

Language	*Here people play language games*
("solid" system of propositions)	("liquid" system of propositions)

As the world cannot be described without using one of these theories, we ought to speak about the pluralism of the world. Consider two judgments:

(1) The Earth rotates around the Sun,

(2) The Sun rotates around Earth.

The contradiction disappears if we say that

a) In heliocentric system, it is valid (1),

b) In Ptolemaic system, it is valid (2).

Even neglecting exact scientific postulates, one may say

1a. The Earth rotates *relative to* the Sun,

2b. The Sun rotates *relative to* the Earth.

Linguists and philosophers deal both with empirical and empirio-critical perception of the world. Language as a tool of creation of reality offers these two dilemmas. The concept of truth seems to be of different nature. The truth of Russellian propositions is that of *de re* (a modality of things) while the truth of Wittgensteinian propositions is that of *de dicto* (modality of statements). In the first case, there is no danger that the reproduced reality will be "damaged" by adding something. In the second case, the truth is "more active" and leads to its verification (empirical analysis).

Sensual reaction on external stimuli is thus both objective and subjective. Subjectivity means a cogitative sphere – a creation of things is carried out with the help of signs; thanks to them we conclude about things given in experience. Any signs are energetic "output", a reaction on "sense-data". And language in general is a reaction on sensations. We thereby distinguish between things *in language* and things *in reality* (i.e. in sensations). The last point can be introduced as follows:

1. *Real things*: do not require provability (If there is a day, then there is a night).
2. *Things unreal because of provability*: this class of things cannot be perceived and thus understood by conclusion (We will never know how big a capacity of energy in the Universum is).
3. *Thing unreal per se*: they are never perceived directly or grasped by means of conclusion on the basis of similarities (atoms, vacuum, corporal time, etc.).
4. *Temporarily unreal things*: they can be discovered in the future.

The first point is connected with language coordination, with situations in the world; the structure of propositions depends upon it. However, the nature of language-speech sphere is not only material, conceptual, or empiric, but also functional. Function is a unity of constancy and variability, static relation and kinetic transition. It is a self-actualisation.

Table 15

Relation	visible	***Essence***	general	static
Function	relevant	***Reality***	special	dynamic
Transition	real	***Phenomenon***	single	kinetic

The top line characterizes the language as a categorial system; the lower line refers to the speech process; the middle line points to "energeya" (according to Mr Humboldt) or language reality. The general function – representation – is a direct activity, correlating with designation, so that the formation of the language picture of the world is carried out in "circulation" of speech, which begins with a non-linguistic object for an addresser and finishes with a quasi-identical object for an addressee. Within such "circulation", the scientific picture of the world overlaps with common knowledge by creating the metaphorical picture of the world:

"Language picture of the world" (fragment)

A. Universe:

1. Sky and celestial bodies: stars, planets → weather and winds;
2. Earth: relief and landscape → waters → soil → minerals → metals;
3. Flora: trees → cereals → vegetables → fodder;

B. Man:

1. A person as a living being: sex → race → bodies and functions → dream, etc.

"Metaphorical picture of the world" (fragment)

1. Sky and celestial bodies: star of good luck → hurricane of anger;
2. Earth: the mountain of happiness → sea of light → metal in voice,
3. Flora: the root of a problem → an oak, a mimosa (about a person), etc.

1.3. Knowledge (III)

Traditional logic operates so-called "laws of thought" being valuable in inductive and deductive systems: (I) law of identity, (II) law of contradiction, (III) law of excluded middle, (IV) law of causation, (V) law of sufficient reason. Although some philosophers attack Aristotelian logic (Hegel, Dewey, Brower, Korzybski), it remains stable within the centuries. As thus, human thought has a correct form of *Modus Barbara*: if *A* means "All men are mortal", *B* – "Peter is a man", then "Peter is mortal". The conclusion is clear: since Peter belongs to the concept *man*, he must be mortal.

Mr Levy-Bruhl discovered that the thought of ancient peoples was indifferent to the principle of contradiction expressed by the formula $a\bar{a}=0$, so that in pre-logic it is valid, if *A* means "Some men are fast", *B* – "Deer are fast", then "Some men are deer". The superior form of thought – scientific thought – corresponds to logic in its full form. It can be represented inside Aristotelian square as A, E, J, and Q. These forms reflect the statements of the kind P(a), Q(a), R(a), S(a), where 'a' is a name of an object (a thing); P, Q, R, and S are predicates denoting physical qualities: "hot", "warm", "cold", "cool", etc. The predicates differ from names through their gradual character. Mr Ceccato found out that the simplest construction of thought is "a thing", for example, "a table" and the other essences are attached to it as far as thought requires them. The word is never a copy of the object it designates, nor is it the mental counterpart of physical things. Compare (see works by Mr Reiser):

Table 16

Law	As a Law of Reality	As a Law of Thinking
Law of Identity	1) Everything that exists, exists. 2) The thing is what it is.	1) The meaning must be constant in any universum of discourse.
Law of Contradiction	1) Everything, that does not exists, is non-existent. 2) The thing is not that it is.	1) The word does not mean what it does not mean. 2) Two negations give affirmation.
Law of Excluded Middle	1) The thing either exists, or it does not exist. 2) The thing cannot have contradictory meanings.	1) The proposition is either true or false. 2) The class is either included into another one or it is not.
Law of Causation	Everything existing has a cause	Propositions are the cause of mind.
Law of Sufficient Reason	Everything existing has sufficient reason	What is true and what is false must have sufficient reason.

A causal theory can never explain the meaning of words. The grammatical categories with all their peculiarities, exceptions, and infractions of rules are but the crystallizations of the unsystematic and purely practical attitudes. The linguistic expressions, according to Mr Werkmeister, reflect the concreteness of primitive man's point of view. In order to express temporal distinctions primitive man frequently employs space-words in referring to time or he defines temporal relations by means of such words or phrases as "being occupied with", "to continue", "accompaniment", "completion of an act", "cessation", "to follow after", etc.

Mr Werkmeister revealed, "The ideas of self in primitive languages were at first inseparable from the concrete conceptions of the body. This fixation of the "self" in terms of the body is supplemented in some languages by the use of special space-designations. Locatives and demonstrative pronouns become the basis of that greatest device for grammatical substantialization, the article – a fact which emphasizes the dependence of "objectifications" upon space-conceptions and upon spatial integrations. The concept of objectification also makes no clear distinction between "action" and "being". The Eskimo, for example, does not say, "He stabs me", or "He sees me". He says instead, "My being stabbed by him is", "My being seen by him is". In Chinook, one says, "Once more her lie has done her", instead of, "She has lied again"; or, "His sickness came to be upon him", instead of, "He became sick", etc." Evolutionary serial thinking substitutes pre-logical ideas. In ordinary language, this case reflects in the affirmative statements with two functions – the description (or naming) of a situation and the confirmation of this situation as really existing. Ex.: pre-logical sentence "Polar bears live in the Arctic" transforms into

⎧ It takes place that
⎪ There exist — polar bears (live) in the Arctic.
⎩ It is valid that

1.4. Facts and Hypotheses

The science deals with logical ordering of facts, i.e. with objects in the language. Any fact is a condition by which a person perceives a thing. The concepts *table, car*, etc., are not yet facts in contrast to the statement "I see a table" or "I see a car". Mr Carnap defines a fact as an event or everything that is expressed in a sentence. The relation between two facts is either a) a simple logical form, b) correspondence between some objects. Mr Wittgenstein believes that we cannot explain this relation further, but Mr Russell is against this suggestion. He puts forward so-called "negative facts": "The table is square" is incompatible with "The table is round" or "The table is wooden" because "to be round" is not the same as "to be square"; it is a negative fact.

Many facts have formerly been hypotheses. From semantic viewpoint, hypothesis and prognosis coincide, but hypothesis stands usually in logical structure at the place of a premise, while prognosis takes the place of a conclusion. From linguistic viewpoint, each statement can be both categorical (predicative) and hypothetical

(conditional). Categorical statement is, for example, “Dies est, lux est”. Nevertheless, this sentence does not explain whether there is a day and there is a night but merely “If there is a day, there is a night”.

Mr Hempel stressed, “All scientific hypotheses containing theoretical terms have “intolerable” consequences. The concept of temperature is a case in point. At first glance, it seems as though the phrase “Object *x* has a temperature of *c* degrees centigrade”, or briefly “T(x) = *c*” could be defined by the following sentence – (D): T(x) = *c* if and only if the following condition is satisfied: “If a thermometer is in contact with *x,* then it registers *c* degrees on its scale”. If the meaning of “if... then...” in the definiens of (D) is understood in the material sense, then that definiens is true if (though not only if) *x* is an object not in contact with a thermometer, no matter what numerical value we may give to *c.* And since the definiendum would be true under the same circumstances, the definition (D) would qualify as true the assignment of any temperature value whatsoever to any object not in contact with a thermometer! Analogous considerations apply to such terms as “electrically charged”, “magnetic”, “intelligent”, “electric resistance”, etc., in short to all disposition terms, i.e., terms which express the disposition of one or more objects to react in a determinate way under specified circumstances”.

The purpose of a theory in this sense is to deduce laws, to “explain” them. But it must be remembered there are always any number of hypotheses and dictionaries which will explain the observed laws differently. When a theory has been adopted, it is convenient to introduce words into our language to describe the “ideas” of the hypothesis. For example, it is convenient to use the words *electron, mass, charge*, etc., when talking about the hypothesis in Bohr’s theory of the atom. Logically, however, they are superfluous as the hypothesis consists of statements about mathematical variables, and the dictionary relates these to statements dealing with observable phenomena.

1.5. Axiomatization

Axiomatization is a special part of formalization. Laws formulated there have to meet two requirements. The first is the condition of “unlimited generality” when the law is valid for any place and any moment of time. The second is the condition when the law does not concern with a definite thing or place. Not all laws satisfy these requirements. For example, many biological laws do not reflect a general state of affairs.

But let us consider an example proposed by Mr Hempel: “On a celestial body with the radius to be equal to the Earth’s radius and the mass twice more, the value of the free fall from the condition of rest derives from the formula $s=32t^2$”. Physicist will claim it is a law although there might be no celestial body to apply it properly. Physicist calls something “a law” even if the condition of “unlimited generality” is indirectly positive. If a statement refers to axioms of a theory or follows from it (as

Hempel's statement follows from Newtonian mechanics), physicist suggests that any approach to the theory is similar to its part.

Our idea of laws is based upon that fact that such a statement as "If water heats up to 100 C., it will boil" is a law in opposite to the statement "If there is an apple, it is red". In linguistics, the situation is different. Mr Büller proposed four axioms. The first represents the language model as an "organon" with 1) things and situations, 2) addressers and recipients. The second belongs to the sign nature of the language. The third separates the language and the speech. The fourth implies words and sentences. Further, Mr Carnap allowed all the statements to be axioms; one has only to build the corresponding language.

1.6. Abstraction

In linguistics, observed language units (e.g. sounds) correspond to concrete concepts of a theory (e.g. the concept *sounds*), while unobserved units (e.g. types of sounds) correspond to abstract concepts of the same theory (the concept *phonem*e). This idea brings together logic of the natural sciences with the humanities.

The laws or generalizations, which we observe, are of two kinds: empirical and ultimate, or primary. We find that a Gothic *g* almost invariably answers to a Greek *χ*, Latin *h* or *f,* a Sanskrit *gh,* and a Slavonic *g* or *z;* but why this should be we cannot at present tell. We only know that such is the case; it is an empirical law, the immediate result of observation, which will have to be explained by some higher and more comprehensive law. These subordinate laws have to be made out before the primary can be deduced from them by comparison; but the primary laws alone belong to comparative philology and the subordinate ones to phonology.

In the natural sciences, the problem arises by analysis of abstractions of empirical level in virtue of observable peculiarities: materialization of things or features is not an efficient condition for extracting abstract meaning. "The heat" in the context of empirical realism will not denote an abstract object. We touch heated things – a bulb, an iron or a teapot – and find that they radiate the heat. *Ipso facto*, we might say instead, "The heated things are calid" or "The heated things radiate the heat"; thus we lose any level of abstraction. The opposite situation one observes on example of such an abstraction as Pascal's curve where we derive at least three associations referring to it:

1) motoric imagination – how the curve appears out off the linear traction;
2) visual imagination – how the curve looks like;
3) language imagination – how the curve will be called.

The first imagination is important, because if we forget it, the concept *curve* will not be existent. In linguistic attitude, the curve is a mere sign and we do not need to know its name. Mr Pascal discovered his curve by motoric imagination. He gave to the curve the name *limacon*, i.e. he has had a finite concept before its naming. Thus, in geometry, one manages to act without words.

A new question arises: “How does the language relate to imagination”? Consider in English such logical connectors as *wenn, as, if, because*. Do they relate to whatever imaginations? In case of Pascal’s “limacon”, the matter was rather simple. His concept is a common noun while the word *wenn* is a result of the language itself, because “cultural” languages did not possess words for logical conclusions at the primary stage of their development. This characteristic continues to be in syllogism where we firstly think and only then formulate.

The language as a complex of all sentences refers to the entire logical space. Every separate sentence corresponds to definite locus. Mr Wittgenstein tried to build a physical or sample space of relativistic theory where every point of logical space would be a possible world, i.e. “logical space = a set of all logical points (possible worlds)”; “logical space p = a set of logical points”. Among logical points only one, say, M is a real-possible world. We do not know exactly where the point M is, but if a sentence is true, then the point M is within the logical boundaries of this sentence: “sentence p is true = point M implies the logical space of sentence p”. If two independent sentences p and q are true, then the point M lies within the logical space, which is the crossing point of logical fields of these sentences. Thus, every extension of our knowledge eliminates that field of ambiguity within which our real world exists.

Polish logician Korzybski distinguished between manyfold levels of abstractions. What do we know, for example, about an apple? It is impossible to know all the features of it. Indeed, we can touch, taste, cut and study this apple under the microscope. Yet there always remain experiences we will not undertake. On scientific or submicroscopic level, our apple is a spatio-temporal event, a chaotic dance of atoms, electrons and so on. The object (not a name) “apple” generates a chain of abstractions. Korzybski’s model is as follows: some threads go from one abstraction to another. The threads do not break, so that we get an object or a name, which belongs to verbal level on the one hand, and events in non-verbal level on the other hand. Finally, we come to the highest level of abstraction: name (the apple) → description (red) → conclusion (to possess elements of oxygen).

“Old” Aristotelian logic is “elementalistic”; it separates the body from the mind while Korzybski’s system takes the organism as a whole. The same way, Newtonian mechanics separates the space from the time while non-elementalistic mechanics and relativistic theory consider “space-time” as inseparable entity.

Scientific abstraction is not a psychological one and splits onto two kinds. The first deals with material objects and is divided into that of qualitative (Hershel’s method for testing of metals), relational (Joule’s law), and quantitative (Enstein’s equation). The second is based upon mathematical level, by taking into account the method of progression.

The signs for concepts are thus imperfect, grasping general ideas at one single point like a sphere lying on a plane. Language does not express the objective and external, but the inward as affected by it. Words are signs to represent approximately what we think about the relations of things. We use these signs, because no word is exactly co-ordinated with the concept which it represents. Consider the Latin

word *homo*; etymologically it means a creature made of soil, and even this is only metaphorically true.

In this respect, the concept of "conversational implicature" in linguistics reflects the abstract nature of words the best way. It allows of assigning identical meanings to expressions denoting different things in reality. Such situation describes Mr Householder on example of words *pink* and *white-red*; they can be both applied to a dress, for instance. But a simple form *pink* will be more preferable in use than a compound form *white-red*, because its grade of abstraction is less vague.

1.7. Imagination

In imagination, as well as in free logic, one finds no contradictions. Russian logician N. Vasilyev, rested upon this fact, developed so-called imaginary or paraconsistent logic within which the statement "Some S are P" is equal to "Some S are non-P" and "Some S are P" simultaneously. Mr Vasilyev concentrated himself on the negative judgments with their subdivision onto formal and material modi. Formal modus presupposes that negative judgment "S is not P" confirms the negation of the affirmative "S is P". Material modus presupposes that negative judgments are formed due to incompatibility of objects. But it is always possible to *imagine* a world in which negative judgments will be formed without the procedure of predicative comparison. Empirical and real laws can be neglected, believes Mr Vasilyev. The concept of negation in imaginary logic arises not through comparison but directly. If the fact 'A' in the imaginable world forms the basis of affirmative judgment "S is A", and the fact 'B' that of negative judgment "S is not A", then the relation between two facts A and B is compatible; the facts A and B can be valid simultaneously. The question is but how objects in the theory of imagination (TI) might look. Let us demonstrate the following modes:

1. A real modus – objects of physical reality, observable and demonstrable (physical and chemical elements);
2. A subreal modus – objects of secondary detection and perception, derived in virtue of inductive-deductive methods (atoms);
3. A quasireal modus – objects, existing as a part of structure, "pure" objects of imagination (quanta);
4. An empty modus – non-existent objects of material world, the main hypothetical level of imagination (quarks).

The objects between levels remain stable in heterogeneous relations; they do not stay in relations with each other over the level, for example, 1-3 or 2-4. The objects in TI are abstract elements: points, lines, figures, etc. By mental "drawing" on a plane points and lines, we get thus an object. "Rotundity" or "sphericity" will not be qualities but object's boundaries. Therefore, it is inexpedient to separate a square from a figure.

Then we pass to the procedure of object's naming. A plane figure with four equal straight sides and four right angles is *a square*. Here it is only one name – *a*

square. Lines, sides, points are not names but transcendental entities as well as numbers. We suppose that animals imagine in this way. And a man alone is capable to "derive" figures, lines, sides, planes from imagination into the sphere of language discourse. This process of naming is very difficult, because all objects of imagination are pure entities. In imagination, any predicate is possible to connect with pure entities: "A figure is red, round, beautiful", etc. But what will we have to say about a named object? "A square is big, beautiful, *round*". The contradiction appears by naming and our solution would presuppose to remove names from science and to keep pure entities: points, figures, lines, etc. In this case, however, we will not distinguish one object from the others if only we do not exclude the position of ostensive definition.

Within TI, we also faced the opposite view expressed by Aristotle that differences between bodies are those between properties, functions and forces. Not figures or numbers are more important but qualities given in sensual experience: warmth, cold, sweetness, bitterness, etc. Aristotle had two approaches to elements: the first is theoretical where elements treat as elementary qualities (an ideal subject); the second is that where the balance of elements is shifted to one of the parties: Water – Cold; Air – Humidity; Earth – Dryness; Fire – Heat. According to Aristotle, from points, space, lines, figures it is impossible to present real things.

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CHAPTER TWO
SEMIOTICS AS METASCIENCE

2.1. Positivistic Semiotics

It is not a secret that semiotics in connection with the development of natural sciences expands its boundaries and goes beyond the field of signs as bearers of information, penetrating the mental sphere of a person perceiving these signs. Semiotics thereby becomes a method of registration of signs, on the one hand, and a method of creation of signs, on the other. In this case, we have to speak about metasemiotics: "X is a sign for Y, when with a certain share of confidence it is possible to conclude about inevitable emergence of Y with X". Such definition is semiotically full: "X designates something in Y". At the same time, X is independent of Y. The sign treats here as a double structure being rather a statement or a judgment used by Aristotle in syllogisms than a mere symbol.

The elementary semiotic model *name/situation* one can meet in the early Greek philosophical thought in medicine, in hierarchy of definitions of diseases (Corpus Hippocriticum): "F coincides either with K_a, or with K_b, or with K_n". Separate types of diseases are designated as K_{a1}, K_{a2}, K_{an}, etc. Each disease differs from another one by means of the sign S, so that for every K it is valid: "K consists both of ±(Sa) and ±(Sb), and ±(Sn)". The aporia arises by the choice of names.

To the objects of semiotics, we refer signs as judgments. The initial point of a judgment is an indifferent *x* to which some values *a, b, c* are being attached. The *discourse* appears by the movement from *x* to *a*, then from *a* to *x*, from *x* to *b*, etc. The result of such "movement" proposes three arbitrary chosen judgments: He is shivering / He is cold / He is shivering from cold. Hence, the discourse is understood as a constant *x* which treats in a judgment as a subject and variables *a, b, c* as predicates whose number can be infinite. Therefore, the subject of semiotics is not merely a number of sign-statements. Just here, semiotics "as if" takes its start. The truth is now reached through the act – from a sign to an action. Actions are defined as manifestation of will, causal sensibleness of soul. However, any action is only a fiction so that we have a question: "How can fiction lead us to true results?"

Let us have a task to calculate the volume of a circle from the radius *R*. For this purpose, a usual definition of a circle will be enough. During calculation we fill the circle space with polygons until their number increases and thus brings us to satisfactory (but not to final) result. The circle is a sign as if it would be a polygon with an infinite set of small parties. A new definition of a circle is thus a fictitious judgment, which is not categorical but conditional. Further, we continue to build fictions, considering the polygon as a prism and calculating its volume (we also take into account the fictitious meaning of π). Such conscious systematic approach to result is an es-

cape from reality, logical kernel of a fiction. In this regard, the science and philosophy (language) are unified: "direct observation – the end of science – the end of philosophy – general principles". This chain is no other than Philosophy + Science. By their expansion, we have statements of various nature. On the one hand, we deal with laws, on the other, with general principles, which are obvious *per se*. Among them, there are statements of intermediate character: Ohm's law, Newton's law of gravitation, laws of electrodynamics, Mendel's law, etc. This distinction concerns double criterion of truth. In science, we get the truth from the facts based on experience. But it will be false to say that intermediate laws are confirmed by the facts. From the statement "All people are mortal", we come to the fact that a certain person is mortal. But from the fact that certain people we know are mortal, it is impossible to come to the statement "All people are mortal" (As long as a person is alive, he/she is not mortal, and after his/her death it is impossible to prove it!).

Let 'SP' be a fictitious sign judgment, i.e. S is considered as if P but in fact Q. The fictitiousness of 'SP' means the validity of 'SQ'. Again, this last judgment takes the form of modal fictitiousness. Such form of connection between judgments is called relative fictitiousness. "A man", says Mr Vaihinger, "is a general concept". While such an image does not exist, the statement "A man is mortal" is false. Only individuals can be mortal.

Mr Vaihinger introduces a logical picture of the world, proceeding from a fundamental problem: "How do we pass from the consciously false representation to the correct one?" According to him, all thought consists of fictions. On the one hand, our representations and concepts are fictitious; on the other hand, they have to correspond to laws of logic. Truth and falsity are not within concepts. They appear in judgments, i.e. not the concept B is false, but the judgment "B exists" (i.e. the sign B exists).

Mr Vaihinger divides judgments into primary and secondary. Primary judgments state equivalence of A and B. Secondary judgments are those in which the act of judgment changes in some way. Both types of judgments are subdivided into

Primary judgments: 1. Categorical, 2. Assertoric.

Secondary judgments: 1. Negative judgments: A is not B.

2. Problematic judgments: A is perhaps B.

3. Fictitious judgments: A is as if B.

Fictions are categories on which all sciences are based. The entire life of a person comes down to a fiction. It is, actually, the reality, the feelings in their successive and coexisting structure. But within our observations, we can be mistaken both in the perception, and in existence of objects. The withheld end of a stick under water seems to be bent, and a mirage in a desert is merely a visual deception. These illusions, from the realistic Mr Frank's point of view, prove that we identify things and situations, i.e. semiotic signs are not what they have to be. Such conclusion, however, is hasty. It is wrong to say that illusions are false, and real things are absolutely true. What real false or true events do force us to imagine a unicorn? It is obvious that between illusions and a fact there is a continuous interrelation. If, for example, we observe a clean sheet of paper on light which continuously passes from red to white spectrum, there arises an illusion that paper is red, just as then one finds out that it is

white. Thus, we cognate only general phenomenological events, and real entities are derived of them. The majority of sense-data represent an essence with hidden properties. A tiger perceived by a person can be striped without one goes into details how many strips there are on his body. In phenomenological sense, it looks so as if a tiger is striped, but there is no such a number *n* by which a tiger becomes a tiger.

2.2. Nature of Signs

The objects of science are not only things but also signs, applying for word-building. The words designate concepts, or represent objects within a paradigm: designation (word-sign) – word meaning, sense of words – concepts – things, objects.

The signs usually stay in binary relations R_1 (Z, Z_1) both in natural and artificial languages. R_1 (Z, Z_1) is a syntactic relation of language signs; their area is called *syntax*. A sign is also connected with other signs and denotes something. This relationship takes the form R_2 (Z, A); *Z* is a language sign, *A* is its meaning. Each sign can be interpreted as follows: a concept is a word meaning, a judgment is a statement meaning. The reverse relation R_2 (A, Z) demonstrates the sphere of *semantics*.

Analogically, semiformal representation of sign relations Z_r can be described as Z_r = R (M, O, I) where *I* is an interpreter. Mr Pierce tried to give classification of signs formally through logic of relations, i.e. he distinguished between predicates of propositions with so-called monadic (is red), diadic (is smaller than) and triadic (gives – to) relations; all polyadic relations come down to them. Mr Pierce understands any sign as a special category. His structure of signs consists of nine types: qualisign (phoneme, sound), sinsign (syllable, morpheme), legisign (word, lexeme), icon (adjective, comparison), index (personal name, number, pronoun), symbol (noun, article, infinitive), rheme (NP/VP phrase), dicent (offer), argument (figures: poetic, rhetorical, and logical).

Let us now suppose that definiens and definiendum are within Euclidean space-time field of four dimensions R^4. Then the vector *S* has to connect definiens with definiendum. Relative to the vector, we may define the concepts of icon, index and symbol as thus:

Icon is a sign whose vector is constant in space and which does not point either to the past, or to the present;

Index is a sign whose vector indicates the past (i.e. the reason, for example the sign of smoke refers to the fire);

Symbol is a sign whose vector indicates the future ("a call" serves as reaction on food for Pavlov's dog).

Signs and their relations belong to a field of representation, so that sign-sentences also represent something. Let us write down a short form: (1) *m K e* where *m, K, e* are expressions for "Moon", "is less than" and "Earth". Structurally, we should organize this statement a bit differently. We need our sign-sentence to look like a figure. Then *m* and *e* are elements of (1), *K* is a relation between them. Thus, we get "m – Moon", "e – Earth", "K – the relation "is less than". Now we may read,

"The Moon is less than the Earth"; the reverse reading (2) *e K m* is also possible. Finally, in order to read (3) *e K s* where *s* is "Sun", it is enough to substitute *s* for *m*. Of course, for reading the statements (1)-(3) correctly one needs to know a key in advance. Nevertheless, to show that symbols of language are not only signs (words) but also relations, which do not represent any type of signs, is more important. Here it must be noticed that the sign-sentences point to certain objects, although their names are neither properties, nor classes, nor relations. In this case, such formulas as $[(x)(Fx \rightarrow Gx) \wedge (\exists x)Fx] \rightarrow (\exists x)Gx$ remain an empty scheme leading to various true statements.

2.3. Signs and Information

In linguistics, information is usually a reference to a certain state of affairs. But the grade of distinction by complete information does not eliminate the grade of distinction by incomplete information. In the case when it is impossible to distinguish "the grade" of information about two persons from the sentences "Peter is short" and "Peter is tall", we can always gather additional information by which we may say, "Peter is very short".

Our measurement of piece of information is of approximate character. The main question is how a sign correlates with information. For the solution of this problem, we apply empiric methods by adding the level of imagination. Mr Stepanov in "Semiotics" described the extraction of information in nature. We go further and concern signs in socio- and psycholinguistics, culture, logic, art, literature, geometry, mathematics.

Table 17

Type	Example	Method	Semiotic operations
Level of Observation			
1	Observation of a stone's dint	Empiricism	Sign in matter and consciousness has different properties.
2	A plant is investigated under influence of light	Establishment of biological determinants	Iteration of sign properties on unconscious level. Analyticity of sign by Kant.
3	Observation of bees' behavior	Biological determinants	Iteration of sign properties on conventional level. Analytico-synthetical forms of sign.
4	Experiment in psychology	Psychogenesis	Putting signs into the language of a person. Implicit forms of signs.
5	Description of a system	Abstraction	Metasigns as operators over definiens and definiendum.
6	Comparison of cultural designatums	Filling of connotative lacunas	Anomalities of signs. Sepir-Worf's hypothesis.
7	Self-reflection	Constructive	Reproduction of sign and its re-

		generalization	thinking. Metacognition.
8	Generation of speech, writing system	Self-organization	Physiological generation of definiens and definiendum. Material forms of sign.
9	Construction of hypothetical models	Induction, deduction	From sign to system.
10	Combinatory logic	Metasemiosis	Sign is definiens and definiendum completely. Pure forms of signs.
Level of Imagination			
1	Logic	N. Vasiljev	S is R and non-R. Parainconsistency of signs.
2	Metaphysics	I. Kant	Sign is transcendental.
3	Geometry	N. Lobachevski	It is no need to follow all postulates of Euclidian geometry.
4	Literature	Yu. Stepanov	Signs are non-conventional. Semiotics of symbolic forms.
5	Syntax	R. Carnap	Identity of sign to itself.
6	Art	Tractatus Seraphinianus	Semiotics of closed systems. Sign is “thing-in-itself”.

In this scheme, a sign is either a symbol or an icon. Information is transmitted through a special sign system – *numbers*. Mr Hilbert supposed numbers to be irreducible objects. Moreover, the objects of the theory of numbers are signs themselves, whose image is independent of place, time or conditions of occurrence.

A new question arises: “Are there signs without meaning?” Evidentially, any sign fixes something; Mr Hilbert probably understood under ‘I’ and ‘+’ not sings but figures, references, or images.

The history shows that there are different forms of symbols in science and even their conventional character does not change situation. These symbols do not denote anything. As a result, we are independent of order of such symbols.

2.4. Grapheme and Word

The most ancient systems of writing were logographic; a word corresponded to a certain sign. Hieroglyphs as bright examples of this kind bear not separate sound elements of which a word consists but all sound units. The sign in hieroglyphic scripture is a bilateral language unit; it sets both sounds and values. In opposite to it, signs of sound-letter writings are submitted only by sound units – phonemes.

It is rather popular viewpoint that graphic language occupies a special place in language being different from that of phonetic. Graphic language is understood as a set of signs for words or their parts (syllables, sounds), for example, ‘G→Ph→D’, where D – definiens, Ph – a component of phonetic language (phoneme), G – a component of graphic language (grapheme). For us it is essential that graphic language is

no other symbolic system than phonetic language. Thus, we define grapheme as a minimal functional unit of final number of graphs. This definition postulates the autonomy of graphemes.

Graphic language contains such sign as '=', '&', etc. and figures which belong to the iconic scripture. In relation to it, it is easy to grasp that the value of such language is not surely a part of phonetic language. Each graphic language designates a certain object or a situation. That is why for the grapheme '=' there are different phonemic sets: 'gleich', 'like', 'equally', etc.

Though we told that graphem directly specifies an object, it does not follow yet that it has a value. It is impossible to think that grapheme "table" possesses the value, which would indicate a certain table. This circumstance demands sharper differentiations of what it is accepted today in linguistics when definiens and definiendum form a unity. Grapheme as sign and value may serve as an example. The sign is an objective essence (a subject reality) while the value is connected with the idea about this entities. Graphic language consists of lines and their complexes, which also refer to external world of things. But these lines in the speech are *isolated* values, loosing relations with a subject and its properties.

The question arises what type of essence represents a word as grapheme. If we pronounce the word *dog*, then it seems to be a few entities satisfying this configuration of acoustic or ideographic events. In this respect, we see a structural similarity between graphemes and phonemes, which are cases of the same word, for example, when writing "dog", *dog*, or "Dog". Let us designate this similarity through *S* and define the word *dog* as a class of those combinations, which are introduced in *S* in the form of an ideograph "dog". Then "*x* is a word" = "*x* is a class which satisfies the following three conditions":

(1) *x* belongs in *S* to something,

(2) if *y* and *z* are elements of *x*, then 'ySz',

(3) if *y* is an element of *x* and 'ySz', then *z* is an element of *x*.

We have to recognize that graphemes and phonemes, which are cases of a word, coincide with it despite some theoretical difficulties. If we write down grapheme "dog", we have to be sure, that the written word *dog* is identical to grapheme. We have also to understand that we deal with intuitively obvious property of the idea expressed by the term "word". What is less obviously, it is a case when the idea of "dog" denotes only one word. It leads us to the following: "Some essence *x* is A, and for each essence *y* it is valid, if *y* is A, then *x* and *y* are identical". Therefore, various concepts can be identical.

In linguistics, graphology is not considered a separate structure of study because a word in most cases is attributed to grapheme. However, when one tries to define "word", it is often impossible to say whether there is a word, a structural group, etc. Hence, the word is understood as language elements united by the fact that they are more or less independent entities.

Syntactic word is a sign with uncertain determinants. It can be semantic word but not always syntactic, especially in expressions "first minister". In literary Chi-

nese, there are no syntactic words. At the same, such languages have signs which cannot be defined: pronouns, deictic words.

Phonologic word is a unity expressed by phonologic means which, in turn, carry semantic representation. However, semantic and phonologic words always do not cover each other. In French, *je ne l'ai pas vu* consists of six phonologic words but four semantic words: *je*; *ne ... pas*; *le*, *ai ... vu*. Mr Vandriyes notes that *je ne l'ai pas vu* is one phonetic word (as far as in French it is possible to speak about phonetic words at all). On the contrary, there are phonologic words which consist of several semantic words, for example, *du*, *des*; *au*, *aux*; *de la mere*, *de la bonne mere*; *du père*, *du bon père*.

Phonetic word is a unity implemented by phonetic means – through syllables and sound borders between them. Sometimes it is not the case, as in example: *vergleich' ich*; *he's ready*, etc. However, while singing a song a phonologic syllable appears as more than one phonetic.

Besides the given groups, there are also identification words, opposite to phonologic ones and consisting of uncertain kind of signs: 'the', 'house', etc. Independently of the situation, the marker of singularity or nominativeness cannot be defined. Such words are the smallest "spelling" language elements. There exist also interpretive, morphological and other types of words.

2.5. Formalization of Signs

The language is a system of objects or symbols produced in unlimited quantity and combined with other forms or propositions. Symbols and propositions are defined for the given language by conventional rules. Such language Mr Curry called "linear"; whether it serves for communicative purposes remains indifferently. Propositions are used in quotes as names, i.e. "x", "hat". The difficulty is that statements of natural language, for example, "Pavel and Peter are intelligent" and "Pavel and Peter are friends" are grammatically identical but in virtue of logical rules have various forms. In the first case, the predicate corresponds to two subjects: "Pavel is intelligent" [and] "Peter is intelligent". In the second case, we do not see that Pavel is a friend and Peter is a friend taken separately, but that they are friends simultaneously: [Friends (Pavel, Peter)].

We seldom use natural language to express relations between branches of sciences. We usually apply object language or metalanguage with some grade of "accuracy" defined through homogeneous and heterogeneous relations. In physics, one defines "accuracy" through instruments and in natural language through logical connections or formal elements. We also need simple and full elements that ensure logical and descriptive relations.

If we would formalize physical objects within a set L(G) of hierarchical concepts, we ought to start with general concepts: 1. Size, 1.1. Linear value, 1.1.1. Height (-5...+5), 1.1.2. Width, 1.1.3. Length, 1.1.4. Volume, 1.1.5. Weight, 1.2. Colour, 1.3. Temperature: numbers - 10...0...+ 10, 1.4. Physical condition, 1.5. Place,

1.5.1. Around, everywhere, 1.5.2. Concrete place, 1.6. Composition, 1.6.1. Condition, 1.7. External condition, 1.8. Velocity, 1.9. Activity, 1.10. Relation to *x*, 1.11. Part, 1.12. Age, etc., etc.

For the further formalization of any kind it is useful to refer to "Principia Mathematica", a deductive system of logic and pure mathematic with few numbers of logical premises, containing logical constants: "or", "and", "equal", "either… or", "not", "all", "to exist". The vocabulary of Principia Mathematica is as follows:

1) Letters *p, q, r* ... replace propositions;

2) *v* is a binary operation, consisting of two or more terms. Thus, "pvq" means "at least one of propositions is true";

3) Symbol '~' is a one-placed operation which implies a term or a complex of terms, i.e. ~p means "p is false", ~(pvq) – "*p* and *q* are false". All logical constants are defined in terms of '~' and 'v', i.e. "*p* and *q*", "*p* implies *q*" and so on. Applying this vocabulary, we can build a set of axioms: pvp.⊃.p – tautology, p.⊃.pvq – addition, pvq.⊃.qvp – replacement, pv(qvr).⊃.qv(pvr) – unification, p⊃q:3.(pvr)⊃(qvr) – combination.

Another mechanism of formalization one finds in Montegue's grammar where each phrase is comprehensible within a situation. For instance, the words *here, yesterday, there* need the denotation of exact location. Indexical phrases are used as corresponding constants or "points of correlation". Montegue's method allows of translating language sentences into logical ones through inductive interpretation.

2.6. Signs and Reality

Linguistic signs, from materialistic point of view, as well as objects, exist physically and beyond mind. But the values exist only in mind. As Mr Solntsev showed, the semiotic value (idea) of a table is expressed by the sounds [table] and a set of letters *table*. The main dogma is that the word gains the value through ostensive definition. But let us construct a complex of symbols for which these or those properties of signs are not ontologically obvious.

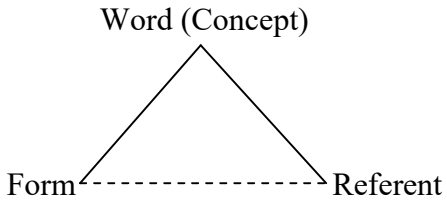
Consider a statement "Atom consists of very small bodies rotating on concentric orbits". For simplicity we, following Mr Williams, reduce our statement up to "There are very small bodies, moving on concentric orbits", or $(\exists_x).BSC_x$. This sentence and its value are represented in a column *A* (from below to top). The value is a simple copy of the class serving as the basement (the first range) which can be stages, parts of small objects, for example "pieces of a stone" and "concentric circles around it". Separate properties of these objects it is easier to designate as dashed lines; that we chose these objects, cannot coincide with the real situation (the second range). The third range shows individual words associated with different properties, and the fourth – the sentence made of them. The fifth range represents all connotative sentence in general. The sixth range establishes the validity of the sentence and its connotation (see Williams' work).

Table 18

Range	**A**	**B**	**C**
Thing	Atom	Law	Sheet of paper
Connotation	something kind of atom		something kind of black shaped sheet of paper
Sentence	$(\exists_x).BSC_x$		$(\exists_x).FLG_x$
Parts of words	B C S	$(\exists_x).OK_x$	F L S
Associations	lines, dots		white sheet of paper, lines, black cat
Types of classes	ball, stones, etc.		paper, shaped ball, black cat

The rest of the diagram is an elementary verification of the sentence from the column A. The column B describes an experiment of the kind $(\exists_x).OK_x$ and the law ('p') whose conjunction with the original sentence gives a statement of the type $(\exists_x).FLG_x$. In such a scheme, the speech goes about physical signs whose denotata refer to objects of the world, and logical signs, serving for connective aims. Both types of signs are used in metalanguage. But their distinction comes down to the formal features attributed either to the sphere of speech activity, or to language as a structural unit.

Of course, the form of many signs depends on referents. When signs are reproduced separately from a listener, the gap between the sign and the referent is obvious. But since that very moment when language is generated by gestures, one may form signs on the basis of visual perception. In contrast to small quantity of onomatopoetic words in speech, the language has rather big proportion of iconic signs. They, undoubtedly, are one of the characteristics of signs referring to designata of natural language.



The dashed line shows that the relation between a form and a referent is indirect. In traditional grammar, a word is a result of combination of partial form and partial value. The opposite side of arbitrariness is called "motivation". The basement by motivated signs will be solid. This type of relation differs from iconicity. If a referent is represented through communicative situation, it is specified conventionally though motivated sign does not require such direct relation between a form and a referent. For example, the iconic sign *ball* is directly motivated by the referent: the shape of a ball is in the form of the sign.

The sign *elephant* may be also iconic, but here the form describes the body and not the shape. Thus, "ball" and "elephant" have a direct and indirect motivated form respectively. And it is correct. When we unite two phonetic aspects (acoustics and an articulation) of linguistic signs, we can oppose them to the third component – a form;

say, *tebl* (as it is heard) – *table* (as it is understood) – *tebl* (as it is said). The form of the sign has to coincide with a real thing or event. De Saussure's scheme for the sign is extremely simple in this attitude and is suitable for a certain type of signs. Generalizing it, each language expression comes down to a name, and the relation of designatum and denotatum is a theory of a naming of language value. This theory leads to aporias, which once again demonstrate the lack of coincidence of language and situation.

Now it is necessary to find out how the value of a sign corresponds to cognitive function of a person. For this purpose, we need to proceed with the well-known scheme introduced by Mr Whorf <situation – direct subjective experience – (linguistic value *a* and *b*) – linguistically caused thinking – behavior>. Here the linguistic form *x* is derived from one general meaning, corresponding to behavior act. Mr Whorf gives an example of word *empty*:

The 1st cycle: non-linguistic observation (container without gasoline) – mental interpretation (container must be without gasoline) – linguistic value (container is without components) – linguistic form (empty);

The 2nd cycle: linguistic value (empty) – mental interpretation (one may smoke) – non-linguistic observation (a worker smokes).

Mr Whorf applied his scheme to physical objects; the length is considered as a model of temporary moments ("day by day"), and the quantity comes down to linguistic form of multiple or dual number. Mr Whorf believed that there are direct linguistic analogs for everything in the physical world. In the language, this case one can trace in so-called "open" and "close" categories. Unfortunately, Whorf's diagram does not reflect the real state of affairs. If everything had looked as on the scheme, we might speak about behavioural constant. However, human habits do not depend on prescribed rules *per excellence*. When workers pass the sign of danger for the first time, they accept the rules of safety. Later they consider this situation as trivial because of "adaptation" to the sign, so that nobody continues to follow even elementary rules.

Therefore, we have to separate linguistic value of a sign from its function. Repeating the same words, observing the same situation, we begin to "eliminate" linguistic value. In this attitude, Mr Chase revealed that word meaning is similar to some feeling: "space-time-event – an object – a word or a symbol (label) – description of an object – conclusion from the description – abstractions".

Consider an object "pencil". On the level "event", it is a chaotic movement of particles. On the next level, our object has a size and other properties unperceived on the first level "event". Further, the object is defined as a symbol, which designates different words. The nervous system allocates them again, adding new signs. We begin to think of a pencil in general, i.e. of its general characteristics in classification of values: 1) event, 2) an object (referent by Mr Richardson); 3) a word *pencil* (a label by Mr Korzhybski, a symbol by Mr Richardson); 4) description of a pencil; 5) pencil as a class; 6) pencil as house accessory; 7) pencils as goods, etc.

Thus, words as a complex of signs have the same “relation” to reality as feelings. They are not connected to it; they are this reality with that difference that they get an abstract nature of higher order.

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CHAPTER THREE
THEORY OF JUDGMENT

3.1. "Truth" and "Sense" in Linguistics

The introduction of "propositional function" in linguistics supposes a statement to be meaningful as soon as variable *x* implies a definite value – "x is a man" or "sin x=1". Mathematical equation x^2-5x+6=0 as well as the sentence "The grass is yellow" have that generality that x^2-5x+6=0 is neither true nor false *par excellence*. It is true, if *x* is 2 or 3, and it is false in other cases. The same one can say about the sentence, "The grass is yellow". It is false, if under "grass" one understands something that grows in Vermont in May, and true, if "grass" grows in Vermont in July. The same concerns the word *yellow*.

Such an alternative reading of propositions is a sequence of ambiguous attachment of signs to real things. A pair *signifie/significant* can be "a thing" and "a word" simultaneously. For instance, "trousers" are not a thing or a word; it is a unified idea of a thing and a word. In this case, Mr Wittgenstein pointed on language rules and language games. Although the sense is clear in two propositions "Caesar loves Brutus" and "Caesar amat Brutum", the truth remains a simple convention because both sentences are independent of that they are true or not, because they denote the same thing.

Mr Frege developed two-coordinated logic of "sense" and "meaning" which defined the function of denotation and designation within semantic categories: *Sense←Name→Meaning*. Logic, however, is not related to the real world. Then we do not ask why a statement is true or false. It will be enough to introduce both degrees of truthfulness as a sufficient condition of logic in sense of Stoic tradition or as evident existence of objects in the sense of Plato's tradition. For Frege this philosophical conception is stipulated by one more cause. He differs between an object and a function, but puts together a semantic category of a name and a statement. The statement is a name, which expresses a sense and denotes one of the degrees of truthfulness. As a name refers to an object, it must also correspond to a statement. After that, the value of this statement is an object, which differs from other ones through its abstract character.

Such situation has been understood by many philosophers variously. Mr Russell identifies a statement with its sense, so that terminologically it has two variants: a proposition (i.e. a statement as a sense) and a sentence (i.e. a statement as a language unit). Mr Russell mixed these concepts. Mr Carnap used terms "intensional" (degree of truthfulness) and "extensional" (proposition) instead of "sense" and "signification". Russell's modification of Frege's semantics led to isolation of a statement from "individuals", "classes", etc., and to vague definition of propositional function.

Sometimes one can speak of the function of a statement with a name argument in logic of predicates as a substitution for the concept *predicate*. But we may develop three-level semantics where categories “a statement” and “a name” are essential. If we compare three-level semantics with two-level, we notice that “sense” refers to “signification” and “meaning” to denotatum or designatum. The difference boils down to the function of denotation and signification. Meanwhile, the process of abstraction is being mixed in two-level logic. Mr Wittgenstein distinguishes between “a sentence” and “a name” in such a way: “Names have a meaning and sentences have a sense”. But this distinction cannot be drawn through an essence which builds a sense of a statement and which is something other than a meaning.

3.2. Nominate Judgment

The function of judgment forms a content that appears as a thing or a certain activity. This form belongs to the sensory perception. The linguistic form of such judgments is so-called pure simple sentences such as: “The house burns, the water rushes, the wind howls, the enemy comes”. Subject and predicate are elements of judgment and unconditional parts of completed act. Subject and predicate as such are not propositions. Only their union in judgment produces an idea shaped by the judgment. In perceptual judgments, the subject is a sensory perception. It is independent and uniform complex of sensations. As soon as the root of complete sentence and subject is designated with a special word, this autonomy increases.

A person makes external world his own intellectual property. Once the idea of a flowering tree has been put into the form “A tree is blooming”, “tree” no longer means the whole process. Something else has to be added to introduce a particular process. Of course, other activities of the tree are now involved by adding something to “tree”. The subject forms the “tree” which has now become the word. Thus “tree” and, of course, other subject-words very soon receive general meaning, which Mr Leibniz claims for every word. “Tree” now means the bearer of those forces that are equally active in all trees. Only then, it is possible to summarize similar things in a thought act under “concepts”. Many have tried to explain the origin of concepts, without taking into account the function of judgment and language, merely from the association of ideas. In fact, the unity of complex of sensations already present in the perception in connection with similar associations can produce a kind of typical ideas. In such ideas, however, the common features are related to individual differences. As we try to capture an idea, it dissolves into a plurality of individual ideas. Only when this notion has passed through the linguistically shaped judgment and has found a form hold in the subject-words, it does become a suitable element of thought as the element of judgment.

If, therefore, the name *tree* is a subject of all judgments made about trees, then this complex of sounds becomes the bearer of characteristics being common to all trees. However, these features are not properties in a logical sense but impulses of will.

The subject-word also clarifies the idea of a potential activity that is inherent in things even when it is not effective. The subject-word finally prepares the formation of abstract concepts, since it is the bearer of invisible abilities imagined within the thing. Here we concern a class of judgments in which the meaning of the subject-word becomes particularly perceptible. At the same time, this is a class of judgments which on superficial consideration does not appear to fit into our scheme, but which is suitable for supporting our theory. In such judgments, the given perceptual content belongs to a known class of objects. "That's a tree", "That's just a nebula" are examples of such judgments. The content, as we speak here only of perceptual judgments, is always taken from the realm of sensory perception. So let us imagine as if we walk on a flat country road at sunset. From afar, we see an object that arouses our interest. The darkness does not allow of recognizing it. We catch it by eye and coming closer we find it is a tree. We, then, say something like "That was a tree!" or "Ah, a tree!"

The situation is not much different when we get the answer: "That's a tree". What happens when we make such a judgment? The logician will say we subsume the subject given as indefinite perception to the well-known predicate-concept *tree*. What the logician says here is correct. If we want to examine general conditions of a judgment, then one grasps the perceived object as a single concept and "tree" as the corresponding class-concept. However, it will be necessary to establish the characteristics of the perceived object and then to check whether all objects with such characteristics belong to the scope of the term *tree*. By determining of a plant, one can observe logical procedure precisely and easily, and the result is finally a designation judgment. But if we ask about the psychic process under circumstances described above and make the judgment "That is a tree", the matter is essentially different. The logical operation cannot provide any information about the psychic process within its formation. In this process, however, there is absolutely nothing to be called as "subsumption".

The perception, which at first I could not interpret, is now understood as the effect of those forces, to whose experience I have come to know the subject-word *tree* in my previous experience. "This is a tree" means first of all a tree as a result of the described circumstances. But this blurred perception disappears from consciousness with the precipitation of the judgment. The demonstrative "that" becomes clear when the judgment designates an individual object, which has just been recognized as a tree. Thus, according to our theory, nothing hampers this single tree to be a subject. The predicate then passes into the property "to be a tree", and the judgment approaches those judgments in which only the properties of the subject are given, for example, in the judgment "My brother is a soldier". However, the meaning of the predicative noun is by no means the same in both cases. In judgments such as "This is a tree", the subject "tree" predominantly expresses the subject function. In the judgment "My brother is a soldier", "soldier" is dependent bearer of acting forces, but it merely designates the epitome of my brother's occupations. In German, Latin and Greek this difference is not expressed linguistically, since in both cases the predicate stands in the nominative. But there are languages where this is different. In Bohemian, e.g. in the judgment "That is a tree"("To jest strom") the predicate stands in the

nominative, but in the judgment “My brother is a soldier” (“Bratr jest vojákem”) is used so-called instrumental, and thus the adjectival character of the predicative nouns come to expression.

3.3. Existential Judgment

The concept of existence, like every other concept, is the result of an abstraction. The so-called inner perception owes its origin. In the perception of a mental process, the recognition of its existence is a complete self-deception, and this assertion is itself the strongest argument against the doctrine of the evidence of the internal perception.

The concept of existence is a means of thinking, which turns out to be necessary to facts of high generality. Every idea contains the concept of existence implicit in itself. Everything we imagine we have to think of being existent.

The concept of existence is the heightened concept of being. The subject as a judgment element is a bearer of forces. IE languages show by their reduction some peculiarities in this direction. In archaic Latin when asking about some text or the instruction “What is it?”, the answer was not “It is a law” but the sentence of existence “The law exists, the law is” (“Quid est?” – “Lex est” instead of “Id est lex”).

One group of such facts one can find in Old French. In the sentence “Se est il” – “It is he”, *il* was a subject, and *se* was a predicate. In modern language, on the contrary, *se* is a subject, *il (lui)* is a predicate: “C’est lui” – “It is he”. Accordingly, in Old French it is unusual, from view of modern language, the connection between such a question and an answer like “Qui est che la”, – fait ele, – “Dieu?” Et dist Perchevaus li gentieus: “Pucele, je suis Perchevaus”. “Who is here”, she asks, “The Lord?” Noble Perceval answers: “Girl, I am Perceval”.

Modern Russian is in this regard similar to modern French, differing from Old French. The statement “I (am) Ivan” by response to the question “Who is it?” seems to be illogical. We would rather expect the answer “It is me, Ivan”.

In Latin, on the question *Quis est?* – “Who is it?” one answers “ego sum” (1) which is illogical as well as Old French “je suis Perchevaus”, because Latin meaning is “I am, I exist”; but in this situation the sentence is “It is me”. Compare: “Quis est qui me vocal?” – “Erus atque alumnus tuos sum” (Plautus. Captivi). – “Who is that calls me?” – “I am your master and pupil” (instead of “I, your master and pupil”).

If identification relates to the third person, a human being, then the formula remains the same; only the personal form of a pronoun changes. If something identified is a thing, then two formulas are possible. The first overlaps with previous one: “Quid est?” – “Lex est”. / “What is it?” – “The Law is (exists)” (2). The second is rarer: “Id est lex”. – “It is a law” (3).

It is possible to notice something general that explains why on the question “What is it?” in one cases the answer is “Lex est”, in others “Id est lex”. In the given examples, the pronoun of neutral gender is used with abstract nouns, and for this reason it becomes a subject. We find the same tendency in Old French with that difference that in Latin it did not become the rule, it is still an exception from rules.

If we group all cases of identification, we will receive the following propositions, expressing the same judgment: 1. Ego sum (I am); 2. Lex est (A law is); 3. Id est lex (It is a law). From these three sentences, only the third (the rarest in Latin) is similar to those of modern French and Russian. Modern French generalizes all three types in one language formula: 1. C'est moi; 2. C'est la loi; 3. C'est la loi. By comparisons with Latin examples, we see that the general form of judgment is other, not general but special language expression.

3.4. Impersonal Judgment

The predicate tells us what the thing wants, what it can do. By separating the predicate from the linguistically pronounced judgment, it becomes possible to look into details. The sense of the word *warm*, which is so different from the temperature sensation "warm", becomes a new base for thinking. All types of sensation of warmth are thereby combined and separated from the exciter of the heat. The sensations of temperature are now grasped as the effects of the center of force newly created by the word *warm*, and this center of power becomes the subject of new judgments. Often it also takes on the form of the noun: "warm" becomes "heat". But with that, it ceases to be a predicate; it becomes the subject and now autonomous and anthropomorphic. The predicate always remains dependent. The cultured languages developed for verbs and adjectives their own parts of speech, which bear this character of independence and clearly show the relationships to a bearer in the personal endings and genus forms.

It is incompatible with the nature of judgment that it consists only of a predicate. However, such judgments are found in the so-called "Impersonals". In all IE languages, we find propositions, which seem to designate a simple process without breaking it down into subject and predicate. Such phrases are "It is raining", "It is snowing", "It is flashing", "It is burning", "It is warm" etc. This form of sentence occurs most clearly in the so-called "meteorological verbs". In the meantime, however, the form is further developed in some languages, and it is often used in passives in intransitive verbs: "Hier wird getanzt", "itur", "ventum est".

The variety of such propositions in the Slavic languages has led Mr Miklosich to study them. It has been shown that the discussion of this linguistic phenomenon interferes with the question of the nature of judgment. Does the sentence "It's raining" have a subject or not? And if it has, what is it? Miklosich's most radical approach concerned Brentano's psychology. According to him, the impersonalia are subjectless sentences. They designate a process, an activity without saying whose activity it is. In traditional logic and psychology, Mr Miklosich found no formula for his conception of this linguistic phenomenon. According to Brentano, it does not belong to the essence of judgment to insist on subject and predicate. Judgment is simply recognition or rejection of a mental image, and it makes no difference whether that content is one or two-fold, simple or compound. Mr Miklosich teaches that in the sentences "It is raining", "It is snowing" the idea of the rain, of the snow is simply recognized. Bren-

tano has welcomed this conception of the Impersonalia and believed in finding a confirmation of his judgment theory. Mr Marty then tried to explain this in detail in his articles on subjectless sentences and to prove that the Impersonalia are to be regarded as existential sentences. Mr Sigwart has also made a detailed classification of the Impersonalia. Even those who consider Brentano's theory of judgment to be completely wrong can nevertheless see in the impersonals one-part judgments. In the judgment "The tree blossoms", the uniformly given conception of the content "blossoming tree" is formed and articulated in the manner we describe more frequently. You can tell by the judgment: "It does not rain'. The content of the imagination given by the perception of the rain is experienced by the judgment. However, the strange thing that needs explaining is not the fact that it is not said that it rains but that no cause, no originator of the rain is called.

What distinguishes the meteorological propositions from others is the fact that the rain is not decomposed and is called "falling water". This led Mr Jerusalem to suppose that in the impersonals we have a part of that period of speech where the root had not yet broken up into subject and predicate, but it was enough to designate an entire process. In fact, even today the meaning of the words *rain, snow, hail*, which unify the thing and activity, seems to be a rest of old language material.

Marty's conception of impersonals as existential theorems is untenable, full of confusion and inner contradictions. It is not right to say that in language terms "It rains" means something like "Rain is". This latter mode of expression is uncommon. There is an essential difference between the meanings of sentences "It is raining" and "Rain is". The sentence "It is raining" is pronounced when someone perceives the rain. Anyone, who hear "It's raining", will understand that it is now raining. This relationship belongs to the constant "meaning" of the present. The listener is asked to introduce the speaker's environment. In existential sentences, however, such a request is not evident. As soon as one says, "It is raining", the form of the existential theorem gives "Rain is", and the meaning of the present immediately shifts. The sentence no longer means "Here in this environment it is raining now", but it means that there is such a thing as rain in the world at all. To point out this fact is seldom an occasion, and if it is the case, at any rate, "Rain is" means something entirely different from "It is raining".

3.5. Conceptual Judgment

The isolated consideration of concepts has been of great advantage for certain logical purposes. In fact, the concepts are elements of judgment, which only develop "real life" in the judgment. The subject-word in a perceptual judgment is a concept insofar as the word has a general meaning and denotes the individually determined thing. But since in a perception-judgment we have merely this definite thing in mind and regard the process as this definite activity of the thing, the subject-word of the perception-judgment is not a concept in the proper sense but a real object. For instance, when we hear a sound in which we recognize the barking of a dog, we say "A

dog barks", we have in mind a certain dog in that place. By definition, this dog lacks the most important features, namely the general ones. If one wants to call such subjects "individual concepts", he/she misunderstands the nature of the concept. There can be individual concepts by summarizing the permanent features of a single object in relation to the changing such as the spatial and temporal relationships. But in the chosen example as well as in every perceptual judgment, the subject is a very specific individual in a very specific situation. The subject of the linguistically pronounced perceptual judgment is therefore a perceived individual object whose individual peculiarities are co-imagined. If, on the other hand, I say, "The dog is a pet", then in the subject only the general qualities are designated. Characteristic of these judgments is, first of all, that the content is not given as a vivid idea. It is connected with the fact that the present of these judgments contains no relation to "here" and "now", but it is only the linguistic expression for the objective force of the judgment. It is said in such judgments that an existing center of power has "this" and "that" potential effect.

We have already said that there are bearers of forces in the subject-words and in the concepts of objects arising from them. We used the word *force* without specifying it. By making the subject-word the bearer of abilities, the judgment loses its anthropomorphic character. By virtue of the fact that the predicate is also linguistically expressed in particular, it becomes possible to influence forces. The formation of such concepts is prepared by the experience that the same properties are found in different objects. This succeeds only when the property has found its linguistic term as a predicate of a subject. Let us imagine that a primitive man touches a warm stone. Since he is accustomed to feel a stone cold, the heat may arouse his interest, perhaps reminding him of similar sensations that the sun, the fire, had aroused in him. However, as long as no word is formed for this sensation, the heat will remain connected with its pathogen and cannot be separated from it. But if he forms the sentence "Stone warms" or "Stone fires" when touching the warm stone, then this quality or state has an independent position in the consciousness. The word *warm* soon becomes its center of force. The self-made predicate immediately takes on the subject function. "Heat" is now considered as a being: the predicate often takes on the form of a substantive in the role of a thing. This hypostasis of properties has caused many mistakes. We can still see it by Aristotle who honestly and eagerly tries to emancipate himself from language, as he is a being that lives and works round the objects.

If we say today, based on the mechanical theory of heat, that heat is the motion of the molecule, we do not conceive of heat as a substance dwelling and working within the thing, but in this we also see the activity of a thing. Being warm is the effect of the molecules moving in a certain way. By closer examination, it turns out that the molecules are not the last subjects but only complexes of atoms. But these atoms are nothing else than the substrates for activities postulated by the function of judgment. Actually, we never quite get rid of the anthropomorphism. Activities and changing states make the attention easier and stronger than permanent ones. The former will therefore receive their linguistic expressions earlier in predicate words. The judgments, whose predicates are activities and changing states, were in the Kantian sense "synthetic": the predicate is not yet excited by the subject-word. It will not be

so easy to find an opportunity to detach lasting qualities from their bearers and, in the judgment, to make them independent objects of thought. “White” is inherent in the word *snow*, and the word *snow* is always taken into consideration, and it will therefore not be easy to emphasize this feature in a judgment, and thus to be analytic in Kant’s sense to form judgment. But without such occasions, the concepts of property could not arise, and we must watch how our thinking comes to releasing permanent properties from their immanence. Such occasions will then find themselves when a thing belongs to a group according to its total impression but shows a peculiarity, which makes it different from the hitherto known individuals of this group.

Let us imagine that someone sees a white rose for the first time. Form and smell lead him to the verdict: “This is a rose”. Now, however, this rose differs in color from the previously one, hence “This rose is white”. As much as form and smell sufficed to take the present subject as owner of the forces summarized in the name of “rose”, the feature of ordinary (red) color was already the sum of potential divorced forces; “Being red” is no longer part of it. On the other hand, the “whiteness” is taken as the actual effect of the forces lying in this rose and predicted by the rose. In the judgment “This rose is white”, the given content of the presentation is structured in the same way as in the judgment “The bird flies”. The process judged here is not a temporary movement but a permanent effect of immanent forces. The color is taken as an activity of the “rose”, and this activity is now practiced in a different way than usual. Only when the sight of white roses repeatedly provokes the verdict “This rose is white” it is reflected in these judgments the term “white rose”.

3.6. Relation-Judgment

The relation-judgments are peculiar when nothing else is asserted in them, as the presence of existence of a certain relationship. This seems to be the case in the mathematical formulas and in the so-called “hypothetic judgments”. The formula $(a + b)^2 = a^2 + 2ab + b^2$ or the equation $x = 4$ as a result of resolution are undoubtedly judgments. If one took the left side of the equation as the subject, the right as the predicate, then the meaning of the equation would be $x = 4$: “It is the property of x to be equival to 4”. Now, without prejudice to the correctness the predicate might become a subject. But with this the feature of the subject and the predicate is lost. If one examines exactly what is actually claimed when one writes the equation, one will admit that the equality relation between the two quantities is the most important object of the statement. We do not want to give a property of x, but we say that between x and 4 is the equality relation. The subject of such judgments is accordingly the equality relation between the two magnitudes, and the predicate is the existence, the existence of this relation. Existence, however, means nothing more than the ability to act and the effectiveness.

The relationship of equality will prove to be effective in all subsequent operations. It is often the case that if the expression to the left is a subject and to the right is a predicate. However, this appearance lasts only as long as the left side still has some-

thing unknown. But as the equation is fully understood, this conception is lost. Both sides of the equation then stand independently by themselves, and only the relationship existing between them is now the subject of the assertion. In the case of geometric sentences, the matter is somewhat different. The relationship between cathetus and hypotenuse is certainly taken as a property of the right-angled triangle, the equation $y^2 = 2px$ certainly as a property of the parabola. But in the equation $a^2 + b^2 = c^2$ or $y^2 = 2px$ it is by no means one of the members of the subject but only the relation itself. Mathematic judgments are therefore the purest judgments of relationship that exist, and they assert nothing in them except the existence of relationships. These relationships are by no means to be considered as merely thinkable. These are effective forces and prove to be efficacious in the objective processes.

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PART IV
LANGUAGE OF SCIENCE

CHAPTER ONE
VOCABULARY OF UNIFIED SCIENCE

1.1. Logicism

Logical empiricism considers scientific theories to be reconstructed as formal systems. According to Mr Carnap, within the language in which empirical theory is formalized we distinguish between two separate languages: L_O and L_T. L_O is a language of observation. Its indefinite constants are B-terms that designate general properties, or events (*blue*, *hot*, *big*, etc.), and relations between them ("*x* is warmer than"; "*x* is more famous than"). It is elementary language consisting of logical vocabulary L(v). L_T is a theoretical language. Its constants are theoretical concepts such as mass, electron, charge, or temperature. These terms in contrast to observational terms cannot be interpreted through ostensive definition. L_O is "poorer" than L_T. Lo is an extensional language while L_T implies signs for logical and causational modality.

The real character of B-terms is ensured by observability of their designators. In opposite to them, T-terms do not possess such function. The designators of B-terms can be specified through T-terms, if there is no sufficient justification of empirical truth. For example, "If *i* is heavier than *v*, then the mass *i'* (the mass of correspondence field *i'* being equal to *i*) is greater than the mass *v'* ". Therefore, Mr Carnap concludes that one deduces systems in which true sentences of Lo build another true sentences being free of verification. The vocabulary of L_T and L_O is as follows

1. additional signs:	" ", (" "), "[ ]";
2. descriptive signs:	a) objective constants: *a, b, c, d* and variables: *x, y,* x_1, y_1;
	b) constant properties: Gr (grau), Kl (klein);
	c) variable properties: F, g, H;
3. logical signs:	a) functors: ⊢ not; → if …, then … ; exactly then, wenn … (iff);
	b) logical constants: ⋀ all, every, quasioperator, conjunction (and); ⋁ or ⋁x some, there is; ¬ negation (no); → implication (if…, then…);

The simplest operations may look like

(1) Peter is taller than Vlad *or* F(a,b);

(2) It is pleasant that it is shining *or* G(μ(F(a))).

Examples of compound logical operations are as follows:

(1) All structural societies are functionally indifferent *or* A(y) F(y);

(2) For all structural societies, it is valid: "If they are functionally indifferent, they are vertically stratified" *or* (y) [F(y)→G(y)].

It seems surprisingly, but we cannot formalize adverbs, some adjectives, and prepositional phrases "thought that…", "supposes that…". Consider two examples:

(1) Some men work hard, (2) Some men work. One says that we must take the combination "work hard" as unified extralogical form "For every *x*, if *x* 'work hard', then *x* 'works' " that allows to juxtapose the forms (1) and (2). However, this principle is out of question because there is an infinite number of simple predicates, which can be substituted into (1) and (2). One of the solutions consists in summing up all actions and events, establishing the nature of an object, under the form (1') $(Ex)(Ey)[M(x)\wedge W(y, x)\wedge H(y)]$ and (2') $(Ex)(Ey)[M(x)\wedge W(y, x)]$ where M(x) – "*x* is a man", W(y, x) – "*y* is a working of *x*", H(y) – "*y* is hard".

Relations between the definite article of the English language and the iota-operator in predicate logic are also problematic, especially in so-called "generic" descriptions: (a) Dogs bark; (b) The dog barks (where *the dog* is taken to refer to the species); (c) All dogs bark; (d) The dogs bark; (e) All the dogs bark; (f) A dog barks. Presumably, they would all be represented as $\forall x(D(x)\rightarrow B(z))$. Sentences (d) and (e) refer to a definite set of dogs, which is given in the speech situation, whereas the others are understood as general statements about the species 'dog'. A theory, which accounts for this, will have to include a mechanism, which allows the universe of discourse to change during the course of a conversation and some way of expressing "general laws". The latter might be arrived at with the help of modal logic: we would want to say that (a) is not only about the actual dogs that happen to exist in our world but about all dogs that exist in the possible worlds where the laws of nature are the same as in our world.

1.2. Dictionary of Science

Every language must have a vocabulary and a syntax, which tells how to use the words of the language, i.e., how to construct combinations of words so as to form sentences. In pre-scientific period, the language was considered as a whole organism. But since the classical period, scientific vocabulary became more conceptualized. The description of scientific picture of the world required the usage of categorical language different from that that described the world as a Being. First, there must be concepts, representing properties of objects and relations between them through semantic rules. The extension of vocabulary on every stage of its development may be traced below.

1. Classical period: $S\rightarrow F\rightarrow[O]$ or U-T-P, where S is a subject, F – facilities, O – an object, U – a proper contemplation of subject matter whose result builds up a summarized indifferent imagination about this matter, T – abstract thought, P – praxis. The level T is subdivided into two phases – analytical stage (A) and experimental synthesis(S): $U\text{-}[(A\text{-}S)\in T]\text{-}P\ldots$ In this period, any physical vocabulary consists of empirical and abstract terms, like in geometry.

2. Non-classical period: $S\rightarrow(F\rightarrow O)$ or $U\text{-}[((A\text{-}S)\rightarrow\omega\text{-}(\lambda)\rightarrow o)\in T]\text{-}P\ldots$ These two formulas satisfy the study of macro-objects (ω). Microobjects (o) fall out of analysis and synthesis. Cognition of o-objects in contrast to ω-objects starts on that

higher stage when analysis (A) and synthesis (S) conjoin; at the same time analysis submitts to synthesis. (A) is an abstract vision of micro-phenomena which is produced in science through analytical and synthetical methods. Physical vocabulary contains here directly unperceived facts and events, which become available by the procedure of accumulated empirical experiments. For instance, the concept *atom* becomes acceptable by its observation in Wilson chamber.

3. Post-non-classical period: [(S→F→O)] or U-[(A-S)→ω-(λ)→o∈Tstr]-P… The principle of unified science is fully realized. Physical vocabulary embraces all concepts of the natural sciences; terms of the humanities are reduced to physical ones.

According to Carnap, unified scientific vocabulary consist of

(I) complex predicates of the kind: '... harder than ---', '... solvable in ---', '... by the condition that -.-.'.

(II) universal predicates of every analytical sentence or – if it is a word in language – universal words. A word is also universal if it denotes properties or relations, which analytically belong to all objects of a class. Any two objects belong to the same class if their meaning refers to the same syntactical class.

Example 1. "A thing" is a universal word. Among the words *dog, animal, living being, thing* every word is more complicated than the previous one but only the last is a universal predicate. Among the sentences "Karo is a dog", "Karo is an animal", "Karo is a living being", "Karo is a thing" the context is successfully eliminated. But the last sentence differs from the first through the analyticity of its L-content. If in "Karo is a thing" the word *Karo* is substituted by any other thing-designator, the result will be analogues. In other case, this statement is not a sentence.

Example 2. "A number" is a universal word. Among the predicates "number of the form 2^n+1", "animal", "odd number", "number" only the last is a universal predicate. Among the sentences "7 is of the form 2^n+1", "7 is odd", "7 is a number" only the last is analytical. It has a feature that every sentence, which is its result if 7 is substituted by 3, will be analytical again. Otherwise, we do not get any solution.

The examples of universal words are 'object', 'property', 'relation', 'fact', 'condition', 'process', 'event', 'action', 'space', 'time', 'function', 'class' and so on. They are used for true sentences, which in their turn are subdivided into

(a) singular statements ("Karel Capek was the author of RUR");

(b) singular statements with individual descriptions ("The author of 'Waverley' became a famous writer of repute");

(c) singular statements with individual descriptions and ostensive function ("The results of the experiment on this apparatus were negative");

(d) singular statements with parameters of time and place ("At time *t* and in place *p* the following data on pressure, temperature, humidity, etc., were found");

(e) general statements referring to the class of facts ("Metals expand with increasing of temperature").

The examples of atomar propositions in physical dictionary can be basic mathematical statements, say, Goldbach's hypothesis: "Every number greater than 2 may be represented as a sum of two simple numbers". The compound proposition is

the second Gödel's theorem: "If the formula 0=1 is not provable in Peano arithmetic, than the statement "0=1 is unprovable in PA" is unprovable in PA".

Physical vocabulary must be thus decomposed on categories depending on scientific purposes and embrace in respect to Carnapian systematization

1) logical vocabulary with logical constants (*not, or, every*) and general variables (*x, F, p*, etc.);

2) syntactical vocabulary with the names for signs in *L* and conventional alphabet for unifying syntactical variables *pr, in*, etc.;

3) non-semiotic vocabulary (vocabulary of translation) of descriptive constants referring to non-linguistic entities (things in the world);

4) semantic vocabulary (pure semantics) consisted merely of the sentences M, which contain a) at least one term from semantical vocabulary and b) logical truth. Semantic importance of sentences increases here in the range: (1) "Bachelors are unmarried men"; (2) "Brothers are male siblings"; (3) "Cats are animals"; (4) "Ice is frozen water"; (5) "Grass is green"; (6) "Steel is carbon iron"; (7) "Water boils by 100°C". Semantic-systematical importance is classified as follows: (1) "1+1=2"; (2) "If *x* is longer than *y* and *y* is longer than *z*, then *x* is longer than *z*"; (3) "The shortest distance between two points is a straight line"; (4) "Visible objects are aggregation of molecules"; (5) "Mass/Energy is always constant"; (6) "Life has been developing from chemical elements".

A special class is comprised of objects whose existence has yet to be confirmed – the atoms of antimatter, cancer-causing viruses, Pronin's snowman, etc. Many objects have passed through a period in which they were described but were not yet discovered, such as Priestley's chemical element, which unites with other elements during oxidization, Leverrier's Neptune, Mendeleev's eka-boron and eka-aluminum, Dirac's positive electron, Planck's quantum of energy, Einstein's curved space, etc. Such objects of thought belong temporarily to an indeterminate sphere. In the course of time, some objects are verified and become real, and some are excluded from the field of reality.

1.3. Classification of Terms

A dictionary, as well as science in general, does not exist without terms. Having become a part of metalanguage, terms are exposed to classification due to conceptual framework to which they are applied. Most often scientists derive the following types of terms: 1) entities of higher level than the given one (cellular level, atomic and subatomic levels); 2) concepts arising thanks to idealization (material point, ideal gas); 3) concepts expressing abstract properties, relations, and structures on the basis of real systems (cost, information) or idealized systems (neural network, finite-state machine).

Similar classification one can find in philosophy of science: 1) key terms (a system of coordinates); 2) concepts pointing on existence of causal and necessary rela-

tions; 3) dispositional terms (fusible, etc.); 4) concepts entering into science hypothetically because of creation of theories (molecules, atoms).

The logical analysis of science usually demands the distinction between two concepts: elementary ones reflecting directly experience (white, easy, sweet, a tree, a horse), and constructs, which are not given in first-hand experience (an electron, a phoneme, a gene) and which penetrate science by postulation.

It is not enough to form a term; one must give it the exact characteristic. However, the description of such terms as "electron", "weight" and "electromagnetic field" faces a number of methodological difficulties. If we remain within one conceptual scheme, then it is possible to use such definition of a term at which definiens will be synonymously to definiendum, for example:

1. americium = df. an element with 95 nuclear protons,

2. *x* is harder, than *y* = df. *x* scratches *y*,

3. average density of *x* = df. weight of *x* in Gk./volume of *x* in cm^3.

This method is however not always valid. So, the definition of cephalic index of a person [*x* = df. 100 max. width of a skull of *x* / max. length of a skull of *x*] has true results under more extensive conditions, than americium's definition. The only restriction is to limit admissible norm of sizes for skulls. The other example is the definition of life: Life = df. *x* is a living organism iff *x* satisfies the condition of $L_x=C_x$ where it is required to consider the criterion of compatibility.

On Le Roy's example, Mr Kolakowski showed an extreme view of the conventionality of scientific definitions. According to him, "the majority of these definitions are laws. For instance, the law governing the free fall of bodies is an analytic proposition: it merely defines the free fall".

The task of linguistics consists in searching of exact concept descriptions. This process is rather complicate because each semantic value of a concept is 1) a certain continuum, 2) vague, 3) socially determined, 4) abstract. Mr Carnap separates phrases from a context in which they appear, so that it is possible to construct language where an expression is always has the same sense, i.e. it is independent of a context. Carnapian viewpoint coincides with the opinion that words of ordinary language are essentially antithetic. To explain ability of a native speaker to identify the same message in different phrases and different messages in the same phrase, two languages are used: 1) primitive language serving for unambiguous record of messages and 2) expressional language to which elements of primitive language are translated.

What is finally "a term"? We can give it some definition by the analogy it was made by the editors of one philosophical dictionary to the concept of information: "Information – see "the theory of information". But it will not be, of course, the definition of information any more, but simply the theory of information. Dictionaries often refer from one definition to another, replacing a definition by a class of concepts. We also should replace a term-definition by the doctrine about it, i.e. by supposition (functions of terms in statements). The major suppositions distinguished in scholastic logic were (according to Mr Ockham):

1) personal (suppositio personalis) when the term designates a thing;

2) simple (suppositio simplex) when the term designates a thought of a thing;

3) material (suppositio materialis) when the term designates verbal expression of a thought of a thing.

In these three categories, the major philosophical concepts are considered to be material, on the one hand, and ideal, on the other. A term will be either a thing (direct reference to an object; ostensive definition), or idea of it (imaginable object), or a word (without being defined through other words). Therefore, "supposition" can be assigned to all objects and phenomena; and the terms are simply their verbal representation. So, if we speak about the concepts, which arise in the case of idealization (for example, ideal gas, material point, white noise, etc.), it is possible to compare them with real and empirically established entities. However, some theoretical concepts differ in the same manner as we sometimes doubt whether a body is a sphere.

If we consider Russellian definition of conceptual value of a term, the context containing some terms will mean something even if this term is meaningless. For example, if a word is a predicate, it should not necessarily designate something to have a meaning. Terms and concepts in this case are imaginable: imaginary geometry by Mr Lobachevsky, imaginary logic by Mr Vasilyev, imaginary literature by Mr Stepanov. Imagination is opposed, first of all, to unimagination; its main feature is not a freak of imagination, but full freedom. Therefore, besides logical statements (i.e. constructed by the rules of logic) it is necessary to take into account statements, which one uses as metaphors.

The semantic analysis of terms begins either from elementary groups of terms to abstract ones (observable and theoretical), or from semantic analysis of theoretical terms to elementary ones: abstract terms – an electron, a particle, length; elementary terms – yellow, firm, soluble, i.e. observable properties of bodies. One sets up firstly semantic, or interpretative, rules for elementary terms of observation and then the corresponding rules for theoretical terms. These rules will constantly be improved. Mr Carnap derives two types of terms, which can be found in basic language of physics. Their explanation is offered in the following interpretation:

Explanation 1. A predicate *P* of the language *L* is called "observable" for some organism *N*, if under suitable conditions (for example, 'b') N can appraise the full sentence 'P(b)' by agreeing or rejecting 'P(b)'.

Explanation 2. A predicate *P* of the language *L* is called "realizable" for *N*, if under suitable circumstances it is real to establish the validity of the full sentence 'P(b)', i.e. to reproduce the property *P* in the point *b*. To establish, for example, the importance of the predicate *red*, it is required that *N* would normally perceive colors and that the object, whose color is defined, is in close distance from *N*. By simple observation, N resolves whether the object is red or not.

It is also possible to refer to the terms of language of observation two judgments by Mr Hegel – that of quality or actual Being (with the predicates red, warm, etc.) and that of quantity or reflection (with the predicates elastic, curative, etc.). The first type of predicates serves for fixing of sensual impressions in a limited circle of perception, and the second type belongs to a number of dispositions. If one concerns the predicate *metal*, then metallicity has to be understood not as a set of observable or practically established properties, but as a set of structural characteristics of metal

within the theory about atomic and molecular substance structure. Mr Hegel refers the predicate *metal* to the predicates expressing substantional definitions of a thing. Then such terms as "causality" get into the language of the theory, which Mr Hegel uses in hypothetical judgments.

Finally, there exists an idealistic point of view on the concepts and terms. Mr Hutten supposes there are no ostensive definitions at all. Defining is a linguistic, not a logical task. Syntactic sentences usually describe some experience. But whether such criterion is satisfactory, it depends on observation or an experiment. We can say, "Electron has a charge e/m" (iff its track in Wilson's chamber shows admissible curvature under the influence of magnetic field), but in no way "Electron has a charge e/m because it is an electron".

1.4. Linguistic Variables

Constant and variable elements are the basis of any formalized language. In Aristotelian logic instead of variables were used the letters A, B, C as major, middle or minor terms of syllogism, and instead of constants – relations between these terms.

The analysis of conceptual variables is important for any formal system. Contensive variables do not belong to the language of formal system (they are not among alphabetical signs). They are signs of meta-language and applied for some general rules. Instead of them, one can replace formulas, but here are no variables *x, y* whose values are suitable for any objects. Each variable has an index or a value, for example, x_1 contains individuals, x_2 classes and so on.

Linguistic variable is a word of language, say, the concept *speed, size, mass*, etc. Mr Zadeh refers to linguistic variable the terms of a fuzzy set and with any value on the scale [0; 1]. The scheme of electrical motor with separate excitation can be thus described through statistic features while using fuzzy interpretation. Let us have a rotation speed (v), a current (i), and the case when resistance of the anchor circuit (i) R_r is equal to zero. Linguistic description is: "If *i* is zero-order, then *v* is of middle value; if *i* is almost zero-order, then *v* is of middle or low value; if *i* is large, then *v* is of low or almost low value". Thus, linguistic description is less precise than the number description, because linguistic connectors *and, or,* negation *not* and lexical operators *very, more or less, absolutely, completely, almost* may change the meaning of the context.

In classical logic, the situation is simple; *x* belongs to the set A and takes one of two values: 1, if *x* belongs to A, and 0, if *x* does not belong to A. To define an object within a *fuzzy set* is the task of more complication. For example, the definition of *solid mineral*, to Moose, consists in that that the statement "Mineral *A* is harder than mineral *B*" might have the following operational sense: "Mineral *A* scratches the surface of mineral *B*". It seems the result to be the number 1…10, or the grade of hardness. But the received index of hardness cannot be a number because indices do not possess the features of real numbers. They merely refer to operations of addition, multiplication and so on. The values on Moose's scheme do not reflect all the fea-

tures of real numbers and only show the order of graduation of the quality "hardness".

The information capacity in metric and topologic systems is not equal too; the power of a set of possible graduations of the measured quantity can exceed the power of a set of real numbers. Let an object be described through a number x(t) within the time period [a; b] and let suppose the object x_1 be "better" than the object x_2 iff $x_1(t) \geq x_2(t)$ at any moment from the period of observation [a; b]. Obviously, for the system (x; t) of possible gradations we cannot build the scale (y; ≥) (where Y is a subset of the set of real numbers) such that $x_1(t)$ is "better than" $x_2(t)$ iff $y_1 \geq y_2$, $y_1=\varphi(x_1(t))$; $y_2=\varphi(x_2(t))$.

1.5. Lexical Modifiers

Lexical modifiers ('hedges') are such units of speech that make a statement fuzzy, vague, changing the meaning of words, e.g. *nearly, almost, more, less*. They are usually a part of fuzzy set theory and have common morphological relations with graduate concepts.

The first works belong to Mr Zadeh and Mr Lakoff who set the domain of linguistic variables according to the function f(x [0,1]). Based upon it, one can study different methods of any fuzzy statement. From the algebraic viewpoint, it is unreasonable to deduce the restrict domain of linguistic variables out of function f(x [0,1]). However, any person can try to derive simply relations from it: *true* > *false*, *absolute true* > *true*, *nearly true* > *false*.

As we cannot use the variables *per se*, it remains us to proof their approximate value *ex facte*. One of the approaches consists in showing that the structure of fuzzy sets may reflect the structure of linguistic variables defined by their natural value such that *true* > *false*, *absolute true* > *true*.

Let *Dom (x)* be a set of terms of linguistic variable *x*. If *x* is a rotation speed of electric motor and lexical modifiers *very, more, possible, little* are marked through the letters *V, M, P* and *L*, then *Dom (X)* = {fast, V fast, M fast, L P fast, L fast, P fast, L low, low, P low, V low, ...}∪{0, W, 1}. We get the following calculus: AX = (Dom(x), C, H, <), where H = {V, L, P, M}. Two main terms of each linguistic variable have opposite semantic structures: *to be true* is "positive" and *to be false* is "negative". Thus, we have the scheme [V true > true and V false < false], i.e. *true*>*false*. Now let us demonstrate the domain of the variable "the speed of electric motor" completely: V slow < M slow < slow < P slow < L slow < L fast < L P fast < P fast < fast < M fast < V fast and so on. Every linguistic variable can be expressed in the formula AX = (Dom (X), C, H, <).

As we see, interpretation of lexical modifiers leads us to positive results. Yet any use of them in mathematics seems to be superfluous. Mr Orlov proves this on mathematical models by taking a fuzzy set theorem where three medians of a triangle cross each other in one point: "Let AB, BC, CA be *approximately* straight lines that *approximately* form a triangle with the vertexes A, B, C. Let L, M, N be the mid-

points of triangle's sides. Then *approximately* straight lines – *approximately* medians – *approximately* build the other triangle which is *more or less* small in opposite to the triangle ABC". This theorem is getting rational after determining words *approximately, more or less*. Now we understand AB as any curve line that crosses the lines A and B so that the distance (in common sense) from this curve to AB is little in opposite to the length AB. The theorem can be more "fuzzy" if we say that *approximately* straight lines *approximately* build a triangle whose vertexes are *approximately* A, B, C".

1.6. Autosemantic and Synsemantic Words

Aristotle has given classification of words as to their meaning within a context. They have been separated into two classes: meaningful and meaningless expressions or 'categorematic' and 'syncategorematic'. It rests upon whether or not they can serve as subject or predicate. This distinction has been preserved in the Aristotelian tradition of scholasticism. Only autosemantic words have meaning; synsemantic words alone has no meaning at all and only serve to form meaningful expressions in connection with autosemantic words. From 'any', 'nothing', 'something', one cannot assume that they have any meaning in isolation, but a meaning receives every statement in which they occur. The particles, conjunctions, prepositions, casus oblique, etc., strictly speaking, are meaningless in and of themselves.

For such words, it is by no means true that they have no meaning on their own, because they are also understood on their own. One knows very well, even outside of a sentence, what is meant by 'every' and 'nothing', by 'but' and 'or'. One knows that 'but' indicates an opposition and 'and' a connection, that 'nothing' negates everything, etc. They differ by their meaning without any addition. Signs that really have no meaning are meaningless syllables or words of an unknown language. Signs that have no meaning on their own but that gain it in connection with other signs are the affixes, denoting modus, gender or plural. The definition of 'synsemantic' is not applicable to them, either. Conjunctions and the other parts of speech are quite different. The distinction between 'autosemantic' and 'synsemantic' as that of words with and without meaning is therefore completely incorrect, because there are no words without meaning in the language at all.

If Mr Russell is of the opinion that a description like "the author of Waverly" has no meaning in itself, but receives it only within a sentence, it is obviously the idea that this is not yet a definite one. But we understand what that term means, even if it stands alone. It expresses a certain relationship (author of) to a particular work (Waverly). If a word must name an object in order to have an independent meaning, then only names are autosemantic. Anything that is not a name is considered synsemantic. Which words are names is but arguable. Undoubtedly, the names are proper names. Usually, in addition to proper names, genus names and common names are also recognized. What is considered *nomina* in the grammars of the IE languages are the inflecting words, nouns and adjectives, sometimes even the number-words and

the pronouns. But not all substantives are names; abstract ones are often excluded. For that reason, words that are conjugated or immutable do not belong to the names are synsemantic. This is just a delineation of names due to the grammar of a single language family; but it depends on a determination of what a name is for a general grammar.

With the Aristotelian distinction between categorical and syncategorematic words, a syntactic criterion for names has been given. The subject-predicate form is one of the statement forms. Statements of relationships have a very different structure: they establish a relationship between multiple members rather than attributing a property to a subject. The criterion should therefore be supplemented in this direction. Purely linguistically, not only words for abstraction can serve as a subject, for example, "The hardness of the steel is greater than that of the wrought iron" or "The possibility of a manned space flight is still doubtful", but also words that are certainly not names, e.g. "I am tired", "Someone is ringing", "Who is outside?", "Nothing lasts forever". To exclude such words as names, one more criterion must be added, which is no longer syntactic but logical or semantic. A syntactic criterion is tied to the construction of a language. In a language of another type, it can therefore fail. In the Greenlandic language, for example, a mode of expression that is comparable to the subject and predicate forms only a very small component. In most cases, pronouns possessing ownership are used instead of a subject meaning.

In modern logic, Mr Russell defines a name as a word that can occur in any type of "atomar sentence", that is, sentences without logical constants (such as 'not') and without a subordinate clause. Thus, this definition depends on the problematic of atomic sentences and is therefore limited. Free from such assumptions is the definition of the name by Mr Quine: "A name is a constant expression that can be substituted for a variable". It is clear that none of these definitions determines what kind of words is suitable for the given function and hence names.

It is therefore important to specify a factual criterion for when a word is a name. Such a criterion can be found in the fact that one proceeds from the meaning of proper names and seeks to generalize them. As a proper name calls a particular individual, so it is the function of a name at all to name an object. Calling is something other than describing. A name is a mere identifier for an item without indication of its nature. It only points to an object, it does not say what and how it is. But what is an identifiable object? "Object" is a very vague term. In the broadest sense, it simply means "something". But then every word would be a name. So "object" must be understood in a narrower sense. It must mean something that also exists independently. If a name simply refers to an object without describing it, then it *presupposes* that the object is present. It cannot be constituted with it; it must already exist. You cannot name an object that does not exist because you cannot just point it out.

The distinction between autosemantic and synsemantic meanings cannot be clarified or replaced by descriptive and syntactic ones. For the syntactic words often include a descriptive content. Syntactic words mean internal language relationships, those through which components of sentences or whole sentences are linked. On the one hand, conjunctions have a syntactic function in connecting sentences. But the re-

lationships between the sentences they generate are descriptive by nature. It is the relations of reason and consequence (‘because’) or of cause and effect (‘by that’) or of succession (‘after’) or simultaneity (‘during’) or of the same place (‘where’), etc. The conjunctions are abbreviations for these relationships; they have at the same time a descriptive content. As a result, the division into descriptive and syntactic words does not yield a clean dichotomy, because the descriptive elements overlap with syntactic meanings. One can only distinguish between internal language and extra-language, between syntactic and non-syntactic meaning. But the extra-language does not coincide with the descriptive one.

1.7. Descriptive and Logical Words

In order to leave the word classes of the IE languages (nouns, pronouns, etc.) and to find the classes of meanings which must be somehow expressed in each language, there is no need for comparative analysis. These classes can be seen from modern symbolic logic, from what these own kinds of signs are required to introduce. For it one has to represent the structure of what is expressible in any language. The types of signs in symbolic logic are on the one hand a constant, on the other hand a variable. The logical signs include the constants (and, or, if not) and the operators (all, there are), as well as characters for individuals and for one- and multidigit predicates (properties and relationships). These two classes are determined not by definition, but by enumeration. For the descriptive class, the subclasses are enumerated: characters for individuals, properties, relationships (and functions). The logical signs are listed individually. The classification of descriptive meanings goes back to Aristotle. Aristotle has also cited a simplified category list: substance, attributes, relations.

With individuals, properties, relationships, and complexes are covered not all categories of what descriptive words can mean. There are many words that mean something that is not yet mentioned, namely classes. Classes, Russell argues, are not individual objects, but only linguistic conventions about the use of symbols. These do not designate objects. If definiens is used for definiendum, then no longer a symbol representing a class remains. A class is developed (in logistics) from a sentence function, a sentence schema, such as “Something (x) is a city”. The elimination of the class is that a statement about a class is transformed into a statement about the values that satisfy a sentence function, that is, a statement about individuals who have the property defining the class. But this does not deny the existence of classes, they are merely not applied.

But a class does not simply consist of the individual objects that satisfy a certain sentence function; i.e., has a certain property or relationship, but in their entirety. A class is not a mere multiplicity of objects, not a collective; it is not the common property of individuals but both together: all individual objects with certain properties combined into a higher unity. Therefore, a class cannot be replaced by its members, because that is where the summary is lost.

Descriptive meaning has all words, which mean individuals or classes or properties or relationships or their complexes (functions). A particular individual is designated by a proper name, classes by generic names. But individuals are also referred to by generic names (e.g., a mountain, the mountain, mountains). A particular individual may be denoted by a generic name instead of a proper name, if its meaning is individualized by the addition of properties or relationships (e.g. "the largest mountain in Europe" instead of "Montblanc"). Properties are adjectives or expressions with generic names (e.g. "by wood"), being in the abstract of nouns (redness, sadness).

Relationships are expressed in very different ways: as concrete through adjectives ('equal') and especially through comparatives ('bigger'). Also prepositions mean relationships – spatial ('between'), temporal ('after'), causal ('through'). As abstracts, relationships such as properties are denoted by nouns ('neighborhood', 'kinship'). Finally, relationships are also expressed through conjunctions. They are relationships between facts. 'Within' as a preposition means a temporal relationship ('within a thunderstorm'). But it can also be used to express a difference, an antithesis. 'Because' means a causal or a teleological or a sequential relationship of facts. It does not just create an inner-language connection. Because all these parts of speech mean relationships, they must be counted among the descriptive words.

The descriptive signs are compared with the logical ones. The logical signs are simply enumerated. They include quantifiers, element and class, equivalence, identity, logical necessity, and the like. The logical signs cannot generally be distinguished from the descriptive ones as those which determine the form of the sentences. In natural language, the form of sentences is also determined by specific syntactic signs, e.g. endings, commas. These are not counted among the logical signs. Also the logical constants have their meanings. It is by no means the case that they alone lack meaning and that they only receive one in context. 'And', 'or', 'if-then' are connectives, linking sentences together in different ways. 'And' gives the summary of sentences to a new sentence that is true only if all the sub-sentences are true. 'Or' relates sentences as members of a selection. 'If-then' includes two sentences as conditional from each other. The sentence links have a syntactic function; but that does not exclude they have a descriptive content; like 'but', which combines sentences as well as 'and'. The logical connective can only establish the syntactic relationship by knowing what kind of relationship it has. 'And' means: One sentence (p) is related to another sentence (q) in such a way that it is both parts of a whole being true only if both sentences are true. 'Or' means: A sentence *p* is connected to a sentence *q* in such a way that it is true if one of both subsets is true. The sentence-linking words thus do not simply mean relationships, but the existence of relationships. They are equivalent in their meaning to sentence functions, and thus it is clear that they have descriptive content. This becomes clearer if one does not consider the implications in isolation. 'If-then' is not something singular, but belongs to a whole class of sentence connections, the conjunctions. These all mean the existence of relationships between variable links, the facts of the linked sentences. The conjunctions can also be replaced and eliminated by sentence functions that express this meaning. Thus, 'because' implies the existence of a causal relationship and can be replaced by the sentence function,

"Is a cause of…" Analogously, 'while' (in the temporal sense, not in that of an antithesis) implies the existence of a simultaneity relationship and can be determined by the sentence function "Is simultaneous with…" By the filling the spaces of these sentence functions (which are two because they contain relationships) with particular sentences, the sentence function becomes a complete sentence.

The quantifiers 'all', 'each', 'one' concern the fundamental difference of singular and plural. 'One' means a common character of all individuals, their consensus that each is one. In the plural, 'some', one individual is referred to another and so on; they are related to one another, to a set. 'All' means such a summary of the kind that no object of the same nature remains outside of it. Relations between individuals undoubtedly belong to the descriptive domain. Also statements about identity are relational statements. Identity means one, not two, but one in relation to several. Identity is determined in terms of diversity. Even for the old identity theorem a = a, one needs two signs to show their meanings.

1.8. Synonymity

Identical objects presuppose to have the same properties at the same time point. In quantum physics, we are free from such obligations. In this attitude, a definition of identity for mental and psychological events is more complex. Pain, for example, is shooting, thoughts are gloomy, feelings are deep, and the condition of our brain is neither this nor that. If X and Y are various people, then the property F being present at one of them must be also present at the other. But from the fact that X suggests "Y is suffering from pain" does not follow that X asserts "C-fever is burning Y", even if "to suffer from pain" correlates with C-fever.

Mr Nagel showed that from the validity of a=b does not follow the interchangeability of names 'a' and 'b' in non-extensional contexts *salva veritate*. Nevertheless, theoretical identification often comes down to reduction. For example, by reduction of phenomenological thermodynamics to statistical mechanics the warmth of gas will correspond to the average kinetic energy of its molecules, so that it is possible to say, "In boundaries of statistical mechanics, the warmth is an average kinetic energy of molecules". Analogically, the statement "Water is H_2O" is being understood as "From the viewpoint of chemistry, water is no other than H_2O".

It seems such a principle to be suitable for nomological definitions reduced up to neurological ones; from viewpoint of neurology, "to have pain" means "to have heat from fever". But the situation is such that in nomological statements one may put down "from viewpoint of chemistry" and keep the part "Water is H_2O", while in neurological sentences such reduction is impossible.

In general, the *contingent identity* does not exist between objects or properties. It is only admissible for statements such as "The Morning Star is identical to the Evening Star". The same concerns the sentence "Water is H_2O" which is not analytical; "water" is not the same as H_2O. Evidentially, in analytical languages (do not confuse with "analyticity" in philosophy), we use sentences with the copula "is" which is not

a sign of equality of two names. One may freely say, “Water is H_2O by the nature”. Yet the physical states such as pain or luck are impossible to reduce to objective properties. The nature of pain is other, than that of water. The statement “The nature of pain consists in heat from fever” is meaningless, because the concept of heat is only a correlation for the concept of pain.

On the other hand, each mental condition of *a* must be identical to a physical condition of *a’*s brain. If one sentence “M (a,t)” says that *a* is in condition M, and the other sentence “B (a,t)” describes the situation by which the brain is in psychological condition B, then each M would correspond to B *ex facte*; both sentences would express the same state of affairs. But as we see neither (a) ⋀xt (M (x, t) ≡ B (x, t) (All people are in condition M iff they are in condition B), nor (b) “(a) is valid in case of the natural laws” implicates the identity of M (a, t) and B (a, t). Only if (c) N⋀xt (M (x, t) ≡ B (x, t) (analytically necessary that (a) is valid), it is possible to claim M and B to be identical.

The contingent identity one usually finds in examples “the Morning Star” and “the Evening Star” which designate the same Star, namely Venus, in our world. The fact that Venus is identical to itself is not a contingent situation, however. Within intensional semantics, in which such problems are discussed, one proceeds from a set of possible worlds and an object area U. At the same time, the concept of identity is a basic one. Thus, 1. ⋀xy (x=y⊃N (x=y)) – identical objects are necessary identical, 2. ⋀xy (x≠y⊃N (x≠y)) – non-identical objects are necessary non-identical. But there are also proper names (“standard names”, “rigid designator”) which can designate the same object in all possible worlds, so that if “a” and “b” are such names, then 3. a=b⊃N (a=b).

Analogically, there are non-rigid designators, which can refer to different things in all possible worlds; they are invalid for (3) either. If for example a Star, which in the morning shines the brightest, is identical to that which is the brightest in the evening, does not mean yet that it is valid for all worlds.

The theoretical situation with regard to “word” is the same as with other conceptions in science. One started with the popular idea of “force”, it was found, in the Galileo-Newton era, that one had to distinguish several similar but different things: (1) mass *x* velocity, (2) mass *x* acceleration, (3) mass *x* acceleration *x* distance, and (4) mass *x* acceleration *x* time. Moreover, it has been necessary to distinguish between the written word and the spoken word, and in the spoken word linguists have found it necessary to distinguish between various similar and related word-like things which are statistically correlated in occurrence, but are nevertheless different things. So, Mr Chao showed that “in Chinese the result is that both sulphur and lutecium used to be called *liu*; both nitrogen and tantalum called *tan;* silicon, selenium, and tin (stanum) had similar sounding names. In a recent revision of chemical terms, however, lutecium has been renamed *lu* and the pronunciation for tantalum changed from *tàn* to *t'ān*, so that no longer two elements will be completely homophonous”.

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CHAPTER TWO
LANGUAGE OF UNIFIED SCIENCE

2.1. Physical Discourse

In previous chapter, we found out that thing-language is used in logic of predicates for real objects with some properties. However, it is not sufficient to build sentences referring to the world. While saying "John is glad", we use except of a predicate and a subject the copula "to be" and must somehow formalize it. Thus, the time indicator is to be introduced: glad (John, now). On such a language, the statements of ordinary language can be constructed. Yet the language of physics differs from these object fields. It tells us except of things and time about physical values.

We must distinguish between physical discourse and language as such. Physical discourse may be compared with a map, and language with signs on this map and rules of their usage. Discourse is a sequence of events: phonemes, graphemes, gestures produced by a man and addressed to other persons. Language is an "accumulator" of rules for construction of messages. Physical discourse often appears in non-linguistic context. The author discusses here methods, expresses attitude, reports about reliability and smoothness of appliances, formulates propositions in tables and diagrams. This form of discourse is called "objective".

In physical discourse, grammatically correct sentences reveal that the subject is an individual (singular) name whose referent is a thing, and the predicate is a general name whose referent are common attributes of this thing. The distinction between attributes and relations is the same as between one- and two-placed predicates. Consider situation when an apple is on the table. One reproduces at least two sentences: "The apple is red" and "The apple is on the table". They have a normative subject-predicative structure 'Pa' and 'Oab', where *a* is an apple, *b* is a table, *P* is a one-placed predicate *to be red*; *O* is a two-placed predicate *to be on*. The truth-values of these sentences depend on the real fact. As the subject correlates with a thing and the predicate with properties or relations, the apple is considered as a thing with the property "to be red" and the relation "to be on".

Physical discourse is usually subdivided into two parts. The fist implies propositions such as "Metals extend by heating", the second such as "All material systems, except of water, extend by heating; or it is valid for interval *t* in material system that $v = v_0(1+\lambda,t)$", where *v* and v_0 are volumes, *t* is temperature and λ is coefficient. These propositions are of various degree of accuracy. Propositions with functors are more precise than that of with attributive predicates.

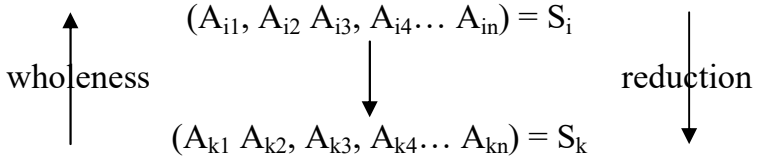
While applying open concepts in physical discourse, the researcher operates with the system of corresponding operational rules. If a physicist had formulated the definition "(Temp (x, t) = y°) = If a mercury thermometer contacts with *x* at the moment *t*, then the mercury column coincides with the mark y^o at the moment t+A",

he/she would understand "if…, then…" as a nomological implication. If so, then the truth of this implication does not follow from the falsity of the antecedent. If we substitute instead of *x* "the Sun" and instead of *t* "any moment of time", the antecedent transforms into the description which is physically impossibile. However, the physicist could have said most likely that there is no sense to speak of the temperature of the Sun from operational point of view.

Nevertheless, operational definitions form the basement of physical discourse. Mr Bridgman explains that we define a physical value by a set of operations. He opposes operational definition to definitions formulated on "the language of properties". For this latter language, it has been chosen the Newtonian definition of time passing uniformly and independent of external phenomena. For operational definition, it has been chosen the Einsteinian definition of two events: the coincidence is defined there by the description of measurement operations.

The other principle of extension of physical discourse is classical reductionism, which rests upon physical laws. The natural sciences consist of levels with different value of completeness. The term "level" does not necessary determine the language level in sense of metalanguage of logic. Reductionism states that every theory which describes a definite level is reduced to the theory with lower level in virtue of logical operations.

Consider two theories S_i and S_k for the levels *i* and *k*. The theories can be expressed by statements A_{ij} and A_{kj}. Now we build three operations of elimination to describe reduction (see works by Mr Nickles):



principle of reduction

1. Elimination $A_{kj} \leftrightarrow (A_{k1} \wedge \neg A_{in})$ Unicorns are fictious animals;
2. Extension $A_{kj} \leftrightarrow (A_{i1} \leftrightarrow A_{kn})$ Light is an electromagnetic wave;
3. Transformation $A_{kj} \leftrightarrow ((\forall_n A_{in}) \leftrightarrow A_{k1}))$ Ideal gases and CO_2 are nothing, but merely Van der Waals' equation.

Thus, all statements of the level S_i can be expressed through the elements of the level *k*. Meanwhile, it will be necessary for the level *k* to imply a set of statements, which allow of deducing all statements within A_i. This idea is successfully proved in natural sciences where such fields as acoustics and thermodynamics are being reduced. However, reductionism faces a problem that a theory is not described thoroughly (as Gödel's theorem about completeness). Reductionism resolved this problem by the principle of correspondence. For example, if two essences *x* and *y* are identical and if *x* has properties O_1..., O_k, then *y* has correspondent properties P_1..., P_k (e.g. the similarity between the light and the sound) (see work by Mr Hesse):

Sound → Light	Volume → Intensity
Echo → Reflection	Depth → Colour

Another example is an analogy between the movement of current in electric circuit and the movement of fluid in a pipe:

Ohm's Law $I = K/L\ (V_1—V_2)$ Pauseil's Law $V = C/L\ (P_1— P_2)$.

Thus, physical discourse unifies a set of rules and theories of reduction. Language, used here, reflects most stages of physical reality.

2.2. Intersubjective Language

The sentences of language have both physical and psychical components of meaning. The statement of the kind "to suppose, that 2 + 2 = 4" is psychological and "to weight 85 kg" physical. Logical behaviorism searches as well as physicalism justification of this dogma *a priory*. If *E* is a psychological language, *Φ* is a physical language, extended for the description of behavioristic terms, then the thesis of behaviorism is as follows: "All sentences of *E* are translated into those of *Φ*". Logical empiricism also searches for exact translation of psychological sentences into physical ones through analytical definitions.

Mr Feigl draws a parallel between pure feeling and action of mind. The connection of neurological processes and sensations is reduced to empirical or synthetical part. Pain, for example, is defined through of the cut or burn, which causes a reaction in form of jumping, shouting, etc. For Mr Feigl, phenomenological predicates have both denotative and designative properties. Thus, the predicate *red* implies "redness", so that the combination of redness denotes a set of physical conjunctions. Mental concepts of nomological (explicit) character are defined through neurological terms. In this case, we speak of general correlation and do not need special language to translate psychological phenomena through physical terms. This point of view defends Mr Feigl, but Mr Carnap answers critically.

The thesis of theoretical identity consists, after all, in possibility to come from neurological extensional equality to identity *in abstracto*. It is clear that the statement "The water is H_2O" is non-analytical. But on the ground of nomological statements, one can say, "From chemical point of view, the water is H_2O". The same is valid for mental concepts reduced up to phenomenological concepts.

Physicalism is primarily a theory about language. According to Mr Carnap, the proposition

B reports that he sees a white circle high up (1)

is true when, and only when it is true that

B's body is now in the physical situation *Z* (2).

From (2) we may be able to infer, with the help of causal laws (in the assumption that B's body is a "normal one"), a further fact

There is in fact a white sphere in the sky (3).

But apparently the "translation" is from (1) to (2). Since these two propositions mutually imply one another, they are regarded as conveying precisely the same information, and so to be one and the same proposition.

It is a case in common language. But scientific sentences are different. The explicit structure of reality in classical physics is connected with objective measurement's procedure and one-valued correspondence between objects and registration of facts. Subjective and probabilistic sentences are not admitted in science. Scientific statements are "2 + 2 = 4" or "There are 9 planets" but not "I think that 2 + 2 = 4" or "I am convinced that there are 9 planets in Solar system". All scientific statements split into two classes. The first contains statement whose truth-value is defined due to simple analysis, i.e. logical signs (quantors, connectors). The second includes non-analytical, or synthetical, sentences. The attempt to define truth-value of these sentences rests on experience. Analytical sentences are linguistically conventional. A new fact cannot be found from them. As a result, the principle of verification is not applicable to them.

There are two formal languages of physics: 1) with modality and 2) dependent upon time features. These languages belong to various fields of reality of classical and quantum physics with various ontological premises. The language of classical physics (C-language) acquires excessive extension through modality. The absolute concordance with objects in the other world remains irrelevant. On the other hand, in classical physics it will be possible to name the objects at *t*. The language of classical physics (C-language) implies objects (things) which exist independent of possibility of their observability.

The interconnection between reality and C-language is one-valued relation; a set of predicates correspond to the objective character of properties. Basic sentences correspond to basic state of affairs and the fact to the truth of basic sentences. One can introduce into C-language modality of necessity and possibility. Mr Leibniz applies, for example, a set of possible worlds to real situation and defines modality as a set *M*. Then a state of affairs is valid at least for one alternative world. Mr Kripke showed the set *M* to be partially permitted to "participate" in this process; there are only those worlds that stay with the real world in binary relations. As C-language is directly connected with visible reality, the reduction of semantics rests on pragmatics and corresponding ontology. There is a world beyond a person and a world of subjective value. The dialogue between participants has a form of formalized discussion: the addressee who asserts a definite scientific assumption and the addresser who tries to falsify or verify the theory by using compound statements with logical connectors such as $A \wedge B$, $A \vee B$, $A \rightarrow B$, $\neg A$.

Ontology of Q-language differs from that of C-language. There exist other conditions for calculus. In classical mechanics, all values are observable, while in quantum mechanics, there are unobservable values, which are united into classes connected with kinematic or dynamic parameters of a system. In addition, in Q-language modality represents extension of language, so that the effects of classical physics are defective. Ontological premises of incomplete definable objects are impossible. Only at definite moment of time, one can set up a value. As the field of object's existence is not fixed, its naming is also variable.

The principle of measuring in quantum physics rests upon an operational part or "semantics" and empirical part or realization of its semantics. Suppose that *Q* has a

value *y* for an object *x* (e.g. the length of *x* in nm. equals *y*). The empirical sentences are not "The parameter Q of *x* is *y*", "In such and such an area there is a microbe" but "The instrument *y* is applied for the measuring of *x*", "The value of the instrument *y* is *z*", etc. The operational part is hypothetical and starts from the possibility of a proof. Being an objective part of quantum physics, Q-reality consist of the system *S* which presupposes to have atoms and basic particles whose existence is defined independent of their observability, so that it may possess properties with no sense for a speaker. In quantum physics or Q-language, logic of microworld does not reflect the nature of common speech. The infiniteness of microworld with its probabilistic aspects is not similar to Cantor's infiniteness and does not refer to a sequence of distinguishable elements. So, the electron is considered as a thing. On the other hand, it is not a thing in its physical sense and may be understood as quantum fields of a definite type.

2.3. Language of Observation

Natural languages contain principles, which are compatible with physical laws. These principles are rarely explicit. Mr Frank asks, "How does the relativity theory use the expressions "motion", "length", "position", etc.?" First, one must note that in physics there is, in general, never any mention of portions of space – only of bodies. The word *space* is used only in the sense of room, hence in the sense of a framework built of bodies. The definition of numerical measure for the length of a body is based in physics on the existence of the rigid body.

From this conclusion, it follows that any language is self-defined in terms of observation. Mr Carnap understood under it actions or habits. Language limitation does not mean the restriction of theoretical thought. There are three components in language of observation: 1) an action or environment of a person, 2) a word, 3) a property.

Pragmatics 1. Wherever people stated the form of sentence "... cold", where "..." is a name, they intend to say that the things in quotes is cold.

Pragmatics 2. The word *not* is used in the sentence of the form "not ...", where "..." is a sentence. The sentence "..." serves for the expression that something does not occur.

The rules, bounding language statements with their designators, i.e. significations, are called *semantics*. Of course, these rules do not correspond to one meaning of a word. But they at least refer to the matter of truth and falsity of a statement. The semantic system of rules is not, strictly speaking, a system of factually given language. The elements of semantics are also signs, words or symbols: '0', '+' and so on. The sequence of such signs is a sentence. The signs are divided into descriptive and logical. Descriptive signs refer to things or properties, logical signs serve for connection of descriptive signs: *not, or, and, if, more, every, all* and subdivided into names (moon, lake) and predicates (cold, blue). Logical signs are subdivided into constant (if, not, then, every) and variable (x, y).

To establish the meaning of a statement, we add definitions until they contain the words whose signification cannot be defined further. In Carnapian "Logical Construction of the World", the reduction equals the replacement of one language by the other in virtue of correspondent rules. Explicit definition is thus a substitution of one term (definiendum) by the other (definiens). The movement from logical positivism to physical language arose from impossibility to explain the relation between scientific statements and phenomenological (protocol) sentences. Mr Carnap offered a method of determination. For example, the term "temperature" is defined through measuring. Mr Carnap aimed to represent quantitative terms ("temperature") instead of qualitative terms ("warm", "hot", "cold"). He also tried to eliminate some terms to linguistic variables, i.e. "Σ term → a linguistic variable". However, not all terms come under this operation. The terms "point mass" or "incompressible fluid" do not refer to empirical sentences. Quantitative content also cannot be expressed intersubjectively through words *blue, sweet*, etc.

2.4. Language of Sensation

Some things we perceive directly, the others we learn through experience. We could associate thing with sensations, but use words of language. The central point of materialism-idealism consists in contraposition between internal, sensory part, and external, physical part. A scientist has no initial moment he/she could consider cognitive theory free from language limitation. The world does not determine state of affairs. Every opinion about reality is a subject's opinion. Mr Kant says that thoughts belong to imaginations. Such internal self-reflection is given through language. It does not result from Kantian invariant structure of human mind, but it is formed by all people. The nature is the subject of experience, but we do not identify it with universe. It arises from facts. The language of observation is a part of physical language. If theoretical terms of physical language are interpreted from the viewpoint of scientific realism, one may say, "The sentences of physical language express natural state of affairs".

Consider that physical events explain laws of experiences. If I apply a set of symbols to denote this fact, the given set will be a proposition of my possible experience: I. I say, "This tree is green" (sentence P); II. Mr John says, "This tree is green" (sentence P_1); III. "This tree is green" (sentence Q). The sentences 'P' and 'P_1' are on the same level because they express perceptions. *Q* implies the fact about a tree and not one's perception. That is why *P* and P_1 do not coincide with *Q*. If I use *Q*, it will be a symbol for me. If John uses *Q* for expression of the same fact about tree, then I can use P_1 to say what John's proposition implies. But the nature of *Q*, how it is used by John, remains unknown for me.

The argument for "common sense" is thus: "There exists physical experience. I see that this sheet of paper is white". This ability is provided not only by the organs of sensations, but also by the presence of black colour. In general, from materialistic viewpoint the sentence [A sheet of paper which is now in front of me is white] con-

sists of (I) logical range of Being (reflection of reality in mind); (II) logical subject; (III) logical predicate. Nevertheless, this realism is untenable.

According to realism, a sheet of white paper is being white even then when we do not perceive it or when it seems to be yellow. But colour is a secondary attribute of a thing and it does not refer to natural laws in opposite to Newton laws. Thus, it does not follow from our subjectivity there is a sheet of paper and it is white. The word *to perceive* one has not to mix up with sense-dates. Mr Descartes thought that latent attributes such as colour are not secondary but evident. However, if we perceive red objects differently, it has nothing in common with the question whether redness is an attribute of a thing. Descartes' argument that hardness is a secondary attribute is also groundless. That fact we do not perceive some things as hardness does not imply yet they are not hard. Analogically, Mr Lock proves secondary properties of heat. He says, "There are three containers with water in front of me. The first contains water of 5 °C, the second of 25 °C, and the third of 50 °C. I sink my left hand into the first container and my right hand into the third one. Then if I sink both hands into the second container, I will feel with my left hand water as warm and with the right hand as cold". Mr Lock supposed the water in the second container to be neither cold, nor warm. Thus, the heat is the secondary property of a thing for him. Thus, Mr Lock identifies properties with relation "more than" and "less than", but it is contradictory.

2.5. Dualistic Language

The word *to perceive* denotes in general an act of observation. Now we show whether there exists connectibility between physical and phenomenological language.

(I) The sentence (1) "There is a thing with property F" cannot be translated into "I am perceiving condition G" (2), because (1) will be false, if there is nobody at the moment *t* nearby. Yet Mr Berkeley has faced this problem. For Berkeley, things are chains of ideas. Ideas exist in mind as perceived essences, it will be also valid for things, and if things and ideas are not perceived by a person, they ought to be perceived by God. But God belongs to metaphysical part and is thus incompatible with (1)-(2). Mr Mill offered the concept of possible sensations. In this case, one can say that the sentence (1) equals (3) "It is possible that there exists a person perceiving condition G at the moment *t*". What kind of possibility is used for this statement? The concept of logical possibility falls away, otherwise the negation of (1) equals "Logically necessary that (2) is invalid". Just this is impossible. For example, it is impossible that there is an observer inside of the Sun "reproducing" a statement of the form "The temperature of the Sun is 20 mil. degrees".

(II). One can substitute physical definition of location and time for phenomenological definition. For example, the location of *x* is also expressed through kinetic sensations. As Ayer notes, such phenomenological dates imply a lot of information going beyond the sentence (1), so that there is no sense to speak of synonymy between physical and perceptual conditions.

Where are the roots of the problem? It is clear that dualism is an alternative to materialism and idealism, conjoining soul and body. Psychological dualism goes back to Plato whose doctrine has recently found its reflection in Descartes' works. There are two kinds of substances: *res extensae* and *res cogitantes*. The body is extensive and without mind, the soul has mind but no extension. Of course, one may imagine that he/she does not have a body and therefore extension. Formally, it looks like "It is possible that X (Descartes) differs from Y (his body), so that X and Y are non-identical". This conclusion is correct. But the proof results when its premises are true, and that it is analytically possible that X does not have a body. According to Mr Descartes, such pluralism is excluded. There exist bodies and souls. But do exist objects, which possess corporal and soul properties simultaneously? A man is "ontological amphibian". Mr Descartes in order not to come to contradiction identified a man with soul. Then it turns out that man is *Deus ex machina*. This *ex* is rather problematic because souls do not possess attributes of place and time.

The gap between psychological and physical terminology can be reduced, according to Mr Kattsoff, "to the ordinary distinction between subject and object, between the "I" and the "It". We can almost speak of a dual language, i.e., an "I-now-terminology" on the one hand and an I-terminology on the other. In the "I-now-terminology" the indicative meaning elements of the words depend on the person who is speaking, while in the "I-terminology" this is not the case".

2.6. Extensional Language

Extensional language, in opposite to dualistic or intersubjective language, interprets all statements monosemantically. As a rule, it consists of such sentences as (see Carnap's works): (1) sentences about real objects: "A rose is red", "Mr A visited Africa", "The Morning Star and the Earth equal in size approximately"; (2) sentences about pseudo-objects: "A rose is a thing", "The book contains Africa", "The Morning Star and The Evening Star are identical in size"; (3) syntactical sentences: "The word *rose* is a word-thing", "The book contains the word *Africa*, "The words *the Morning Star* and *the Evening Star* are synonyms".

Scientific language is an extensional language. As it follows from the table below, the sense of sentences is derived from their truth-value.

Table 19

Semiotic expressions (I)	Intensional language (II)	Extensional language (III)
Individual signs	Individual concepts	Thing
One-placed predicates	General concepts	Class of things
Two-placed predicates	Two-placed relations	Class of things
Sentence	Utterance	Value
Functor	Function	Table of truth

The realization of such program depends on the position of nominalism that does not admit abstract essences into language. The transition from (II) to (III), how-

ever, is a process of abstraction itself because sentences of observation require their confirmation. While physical laws are stable within one system, the sentences of observation refer to unstable sensations. The attempt to transit the sentence “It is warm in this room now” into “There is a perception of warm here now” is impossible. What do we understand under “here” or “perception of warm”? Of course, one may admit spatio-temporal relations there, but the background for such establishment remains intensional. The clause (III) merely shows some logical conclusions.

The problem of extensional language is easier than the described above. Extensional language is not meaningless and its subjective part will always be present on implicit level. “It is possible”, said Mr Carnap, “to talk of language explicitly, by means of quotation marks”. If one does so, then we have the formal mode of speech. But there is in ordinary language a device to enable us to talk about language without explicit mention of expressions and without the occurrence of quotation marks. This is the material mode of speech.

Material mode	*Formal mode*
A rose is a thing.	“Rose” is a thing-word (substantive, noun).
It is a fact that the rose is red.	“The rose is red” is a sentence (statement).

Thus, the material mode of speech is a way of speaking which looks like talk about things but is in fact talk about words. Mr Brennan has shown that “There are many statements which certainly are neither empirical nor in the formal mode, and which we should presume are in the material mode; but they are very hard to translate, sometimes, into the formal mode. In the sentence “There is a cow in that field”, the referent of the word *cow* is a physical object that moos, gives milk, etc. But in the sentence “Cow is a short word”, the referent of “cow” is not the object cow but the word *cow*. These two senses of “cow” illustrate the classical distinction between the objective (“real”) and material modes of speech”.

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CHAPTER THREE
"HEDGING" AS UNIVERSAL CATEGORY

3.1. Bifurcation of Scientific Style

In 1971, a big symposium "Semiotic problems of scientific languages, terminology, and informatics" was held in Moscow under the guidance of Prof. Yu. Stepanov. Scientific text has been firstly introduced as a multiple system where all its elements are grouped by similar components. Such systems are compatible with absolute (in Goodman's sense) predicates; every *n*-placed predicate can be substituted by one-placed predicate and vice versa. The textual structure corresponds then, according to it, to the concept "full information within an arbitrary chosen discoursive space". This process can be compared with bifurcation when a scientist enables to stay between two paradigms – that of linguistic and that of scientific – and has to express his position somehow in a text. Consider how it works on an example taken by Newton and then compare our results with contemporary scientific articles. If we find out something that unifies them, we thus might have to speak of a linguistic phenomenon being common for each kind of science (see also Mr Halliday's work).

Newton's Optics

< If the Humours of the Eye by old Age decay, so as *by* shrinking to make the Cornea and Coat of the Crystalline Humour grow flatter than before, the Light will not be refracted enough, and *for* want of a sufficient Refraction will not converge to the bottom of the Eye but to some place beyond it, and *by* consequence paint in the bottom of the Eye a confused Picture, and according to the Indistinctness of this Picture the Object will appear confused. This is the reason of the decay of sight in old Men, and shows *why* their Sight is mended *by* Spectacles. For those Convex glasses supply the defect of Plumpness in the Eye, and by increasing the Refraction make the Rays converge sooner, so as to convene directly at the bottom of the Eye *if* the Glass have a due degree of convexity. >

As we see from this fragment, Mr Newton intentionally uses in text words for logico-semantic relations and conjunctions *if, for, why, by*. In other places, Mr Newton recourses to nominalization: defect (of Plumpness), Indistinctness (of this Picture). It is remarkable that the author metaphorizes the rheme. In the part of the sentence "Those colours argue a diverging and separation of the heterogeneous Rays from one another by means of their unequal Refractions" the verbs "diverge" and "separate" are nominalized by the contrast to the sentence "There is no such separation... and by consequence no inequality of their Refractions". This step from the theme to the rheme is a dynamic movement in Newton's discourse.

Mr Newton introduces scientific treatises in the 1st pr. sg.: "I did that", "I looked through the Prism upon the hole", "I observed the length". Thus, Mr Newton takes the whole responsibility for himself. On the other side, such approach could be

chosen by him to reaching the self-organization of the text. Mr Newton also applies scientific terms such as: 1) general conceptual terms: 'Light', 'Colour', 'Ray', 'Beam', 'Image', 'Axis'; 2) observation terms: 'specific' (optical), 'Incidence', 'Refraction', 'Medium'; 3) imaginative terms: 'general' (mathematical), 'Proportion', 'Excess', 'Sine'; 4) technical terms: 'Prism', 'Lens', 'Superficies', 'Vessel'; 5) methodology: 'Experiment', 'Trial', 'Theorem'. By the description of experimental results, Mr Newton actively builds compound word constructions: "I observed that, when I did *a, x* happened". In some cases, we meet such phrases as "those Colours argue..." which Mr Newton usually assigns to the part of general discussion.

Now let us compare Newton's style with contemporary scientific articles.

"Betting on Industrial Minerals, Proceedings of the 39th Forum on the Geology of Industrial Minerals, Nevada: Nevada Bureau of Mines and Geology Publication 33".

< *Some* (quantification) of the volcanic rocks in western Nevada represent the precursor of the Cascade Range, and significant intrusions *about* (approximation) 40, 100, and 160 million years ago are *probably* (rate of awareness) linked to similar platetectonic settings, whereby oceanic plates were subducted beneath western North America. *Most, but not all*, (modifier + restrictive conjunction with quantifier) core deposits in Nevada are associated with igneous activity. *In some cases* (first part of subjective proposition), metals came from the magmas themselves, and *in other cases* (second part of subjective proposition), the magmas provided heat for circulation of hot water that deposited metals in veins and fractured sedimentary rocks. >

This text contains, first of all, "hedges", because in geology and physics many data are of approximate nature: "probably", "frequently", "about", "maybe". Lexical significance of approximators increases with the number of categorematic words. In the English scientific discourse, such dynamics is closed to the structure of the German syntax. In both languages, there are also plenty of modifiers and comparative constructions: *more than, less than*. In the Russian scientific discourse, inserted clauses are more common: *in one's opinion*, *it seems to be, in this case*, etc.; modifiers are rarely used. Ambiguity is expressed here graphically, for example, 20-30% in the Russian language [vs] about (circa) 20% in the European languages. The minimal quantity of approximators one finds in Newton's style; only the modifier "about" connects the numerals. Thus, Mr Newton aimed to clarity by his descriptions: "…the Length or this Image of 18 % Feet was about 10 Inches or 10 %", etc.

After Newton's epoch, the scientists faced a new problem – how to speak and write about objects in quantum physics. In opposite to the above example, the modifier "about" in the sentence "This particle is about 5 nanometers" means to be superfluous; it designates not the size of a particle but a field of measurement, because the particle is so tiny that it cannot be exactly marked. It thus does not reflect the common state of affairs. Even the concepts *particle* or *wave* are applied for the description of atomic phenomena both with non-zero rest mass ('electrons', 'nucleons', 'mesons') and with zero rest mass ('photons', 'neutrons').

The physicists do not take care of connectibility of many concepts. In the science, the semantic type of a language is given by the principal descriptive key concepts in terms of which the model is represented. The particle model in classical mechanics, for instance, ascribes a definite position q and momentum p to the particle, and its path is determined by any set of simultaneous values p, q. In quantum mechanics, a particle occupies a certain state of given energy, and we cannot speak of the path of the particle since there are no statements in which exact values of p, q occur. This indicates a change in the rules of formation for the sentences to be admitted to the system. Moreover, the particle in quantum mechanics is not quite the same thing as the classical particle.

3.2. "Hedging" Phenomenon

The development of "indirect communication" is connected with a new kind of speaking: to use words *highly likely, probably, more or less* and the like. This process of communicative isolation was caused by linguistic phenomenon "hedging" or "Hecke". In English, "hedging" is a method of avoiding responsibilities for the truth of one's words. Mr Popper may have put such statements into "unfalsified category". If a layman meets the concept "hedge (Hecke)", he/she will extract following meanings: in German – "Feld", "Grenze", "Markierung", "Windschutz", "verbergen", "brüten"; in English – "barrier", "limit", "defence", "hinder", "confine", "restrict" and so on. And if a person is a linguist, he/she will find out individual connotations of these words: language phenomenon, politeness, vagueness, indirectness.

The concept "hedging" may be defined linguistically as follows:

1) „Bezeichnung für Ausdrücke, die andeuten, in welchem Sinne bestimmte Exemplare einer bestimmten Kategorie zugeordnet werden";

2) „Adjektivische oder adverbiale Wendung, durch die angegeben werden kann, in welchem Masse in einer gegebenen Sprache und dem dazugehörenden Kulturraum kategorisierenden Aussage im Sinne einer Reprasentativitätsskala sinnvoll sind".

In stylistic vocabulary by Mr Wales, "hedges" are understood as modifiers in narrow sense. At the same time, this concept refers to scientific discourse and speech acts.

In Russian linguistics, "hedge/hedging" means "a lexical unit making a statement fuzzy, limiting the responsibility of a speaker".

Before Mr Lakoff introduced the concept "hedges/hedging", a range of studies had been made yet. Mr Weinreich described universal phenomenon, which was neither grammatical nor morphologic. He called such words "metalinguistic operators": *so-called, like, true, real, eigentlich* and others. Mr Zadeh also investigated phenomenon "hedging", applying a fuzzy-set theory for modeling of language structure – grammar categories and lexemes. He showed that if we attach to some concepts (e.g. a fish) lexical modifiers, we define non-prototypes. For example, the statement "Eel is *a kind of* a fish" is admissible, but "Pike is *a kind of* a fish" is absurd.

Mr Lakoff metaphorically transferred the features of green fence ("hedge") onto linguistic phenomenon. Cognitive ambiguity, personal uncertainty, politeness, indirect speech and other discoursive tools refer to this phenomenon. Mr Lakoff came to the concept "hedging" after he had mentioned that the predicates in sentences were more or less fuzzier by attaching words *rather, largely, sort of, kind of, strictly speaking*. Mr Lakoff defined "hedges" as a word or phrases whose function was to introduce things vague. Instead of factual statement ("This remedy will cure you"), speakers often use "hedges" to avoid direct meaning ("I suppose this remedy will cure you"). Later Mr Fraser assigned to "hedging" performative verbs (promise, admit, wish, suggest) ("I can promise you that..."), so that any statement could be modified as neutral.

Mr Schröder proposes to use as "hedges" pronouns, passive constructions, modal verbs, and even particles. Mr Darian says that modifiers belong to any part of speech: nouns (the view that), functional nouns (some feel that...), verbs (we infer), adverbs (presumable) and articles (one solution is...). "Hedges" are also considered as indicators of truth of the whole proposition ("I think, his feet were *sort of* blue"). Mr Erben understands under "hedging" "language signals used for limiting and mitigating of statements". Mr Hyland defines "hedging" polygrammatically. Mr Nikula refers "hedging" to "an open category". According to Mr Pinkal, "hedges" serve for building ambiguous statements. Mr Kolde associates "hedges" with spatial concepts, referring either to a group of ambiguous concepts (e.g., entfernt, nahe, vor), or to a class of binary concepts. The later ones can be changed due to linguistic shifts ("hedges") because they (shifts) treat as separate lexemes (very), subordinate clauses (I suppose), suffixes (red-*ness*), or even paralinguistic tools (anger, winking). Mrs Clemen gives following list of expressions, assigned to "hedging":

Modal auxiliary verbs: may, might, could, would, should;

Nouns: assumption, claim, possibility, estimate, suggestion, probability;

Adverbs: perhaps, possibly, probably, practically, likely, presumably, virtually;

Verbs of knowledge and belief: believe, think, realize, understand, guess, to our knowledge, it is our view that...;

Degree of certainty or apprehension: allegedly, appear, apparently, assume, (un)likely, maybe, perhaps, possibly, presumably, probably, suggest, suspect;

Ambiguity through quality or quantity: about, around, approximately, almost, in some cases, few, fewer than, nearly, often, many, more / less than;

Speaker's opinion to proposition: surprising(ly), regrettably, luckily, admittedly, (un)fortunately, I'd rather, I hope, significant, important, surprised, in my opinion;

Boosters: actually, certainly, clearly, definitely, doubtless, obviously, of course, really;

Modal particles: only, every, well;

Hypothetical necessity: must have, must be, ought to have, should;

Suggestion of subjective prediction: expect, project, foresee; erwarten;

Suggestion through logical consequence: must be, must necessarily;

Concessive and adversative conjunctions: but, however, although, even, nevertheless;

Passive constructions: was assumed to be, is suggested, was chosen, are summarized;

Conjunctive mood constructions: would increase, could easily, might induce;

Conditionals: if... were, ... would ...; if ... is, then it has...;

Impersonal constructions: it is, there is, this is, it remains to be seen.

Thus, linguistic shields are important for communication being a central discoursive tool. "Hedges" appear within a text more frequently than the other linguistic phenomena. Thus, we may speak of a new semasiological process covering the entire categories of words.

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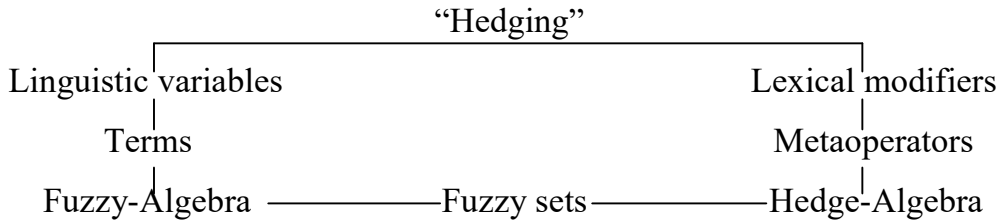
The Soviet linguists did not concern with "hedging", although they investigated something that let them speak of an unusual grammatical phenomenon in Russian – the category of "condition". The dispute around it is even burning today. As it follows from Grammars, the category of condition consists of words not referring exactly to a definite part of speech. These words either 1) denote a condition of environment: *dark, heat, empty, noisy, windy, badly, well*, or 2) express a physical condition of living creatures: *painfully, cold, warm*, or 3) express spatio-temporal relations: *far, near, deeply, shallow, late, free*, or 4) have a modal meaning: *necessary, maybe, possible*.

The category of "hedging" in Western linguistics is no less arguable phenomenon. Its linguistic status is wider than that of the category of condition and can be represented thus:



"Hedging" is first of all a textual phenomenon, while the category of condition is a grammatical one; i.e. "hedging" is not a list of words and expressions but their representation in a written text or a speech act. It finds its interpretation from different backgrounds penetrating pragmatic and discoursive space. Today, it consists of many phenomena which we consider below.

3.2.1. Prototype Theory

As we have seen, the problem of "hedging" arose from that of the natural categorization. Mr Lakoff drew a line between the analysis of such sentences as "Penguin is a bird" (1) and "Raven is a bird" (2); both sentences belong to prototype semantics. If one defines the word *bird* analytically like "A biped vertebrate animal with a beak, two wings, and a feathered body", he/she will hold sentences (1)-(2) true. But if one

analyses (1)-(2) holistically, he/she will find some representatives not to correspond to the concept *bird*. The sentence (1) will be thus false *par excellence*: penguins cannot fly.

The solution of the paradox by the adding of metalinguistic operator *a kind of* – "Penguin is *a kind of* a bird" – will not give a positive result either; in everyday speech no one treats this way. The same concerns the theory of quantification in logic. For example, in the sentence "Cows are mammals" the volume of the concept *mammal* is vague; the subject ('cow') is only a part of the predicate ('mammal'), so that the right substitution is "Cows are *kind of* mammals". This is of course superfluously so that Mr Jewons uses the word *vertebrate* instead of "kind of" to save the situation.

In logic, indeterminate statements are usually *partial* statements. The subject is expressed here through the words *some, many, majority, sometimes, at times, at least*: 1) "Some S are P (non-P)"; 2) "At least some S are P (non-P)". In partial sentences like (1), the knowledge about attributes of a class is complete: "Some planets have necessary conditions for life". In partial sentences like (2), the knowledge is incomplete: "At least some chemical elements are used for atomic energy".

Today, the science substitutes vague sentences by lawlike statements. Compare:

[Before (Mendeleev (1870)]: Atomic weight (Es) will be *approximately* 72. Properties are *between* those of Si and Sn. Volume (Es) is *up to* 13. Weight (Es) is *around* 5.5. Specific volume (Es) is *about* 22. Density (Es) is *circa* 0.96.

[After (Winkler (1886)]: Atomic weight (Ge) is 72.5. Properties are those of Si and Sn. Volume (Ge) is 13.2. Weight (Ge) is 5.469. True.

In general, in science extensional uncertainty does not permit a class of defined objects to be subdivided into two disjunctive subclasses. It remains but unclear whether an object belongs to a class x_i or x_j. For example, the concept *living creature* is fuzzy because there exist bacteriophages within a class of living creatures. A precise definition for "living creature" in this case can be given as follows: Let L(x) be a restricted organic system [O(x)] which interacts through metabolism with environment [SA(x)], accommodates [A(x)], self-reproduces [R(x)], and belongs to the structure [N(x)]. Thus, L(x) ↔ def. O(x)∧SA(x)∧A(x)∧R(x)∧N(x). Conclusion: "Bacteriophages do not belong to a class of living creatures (they lack for metabolism)". But if we extend the area of disjunctive properties, we get SP(x) "*x* is a parasite of metabolism": (L(x) ↔ def. O(x)∧[SA(x)∨Sp(x)]...∧A(x)∧R(x)∧N(x); by removing conjunction from the class of properties, the discovery of bacteriophages will not lead to the contradiction with the concept *living creature*.

3.2.2. Vagueness

Since 1980s, "hedging" is a part of vagueness which embraces a) semantic ambiguity (meaning depends on situation); b) pragmatic ambiguity (meaning depends on one's intention); and c) epistemic ambiguity (insufficient information). For example, the word *tall* is vague because a 1,7-meter-tall person is both "tall" and "non-tall".

The concept *tall* is thus relative; 1,7-meter-tall Indian will be tall for Indians but not for Europeans.

The meaning of words is vague and imprecise. Some words, which designate an infinite or an unstable denotation, are denotatively indefinite. The other words are connotatively indefinite; and their vagueness may be one of three possible types.

(1) It may be intentional vagueness – as it is in the case of meanings such as *about a dozen, more or less, many, roundish, yellowish, thirtyish*, etc.;

(2) It may be vagueness resulting from the comparative significance of the meaning itself – as it is in the case of such words as *young, old, rich, poor, great, small*, etc.;

(3) It may be vagueness resulting from the impossibility of delimitating with precision the intended referents – as it is the case with words such as *chin, hip, thigh, red, orange* and so forth.

Of these three types of vagueness, the first, being intentional, constitutes no linguistic problem. The second type, arising from an indefiniteness of the intended frame of reference, can be eliminated by providing the proper setting for the required comparison. A mouse may be large in comparison with flies, mosquitoes; but it is not large in comparison with dogs, horses, or elephants. References to "here" and "now" involve a related ambiguity; for "here", for example, may mean "here in Germany", "here in Moscow", "here in this house", or any number of similar "locations in space". Its precise meaning must be determined by context. The third type of vagueness cannot be eliminated from language. It is inherent in the nature of the referent. Even the most concrete context of an actual speech-situation does not eliminate all ambiguity. We may follow Mr Bhartrhari to give an account of how the meanings of ambiguous and equivocal expressions are rendered precise by these contextual factors:

Association: The word *Hari* is used to mean various things. It is a name for Visnu, or it may mean a monkey or some other creatures. But the phrase "Hari with a conch and a discus" would be rendered unambiguous, for it would refer to Visnu because of its *association* with the conch and the discus.

Dissociation: The word *dhenu* may mean either a cow or a mare. But the expression "A *dhetiu* without its calf" will be unambiguous, for the accompanying words imply a dissociation which tells us that we are obviously talking about a cow which is now without its calf. Etc.

The above list is not exhaustive, nor is it mutually exclusive, for some of the factors obviously overlap. They can broadly be classified under contextual and grammatical factors (the last two above being obviously grammatical). The contextual may be subdivided under verbal and non-verbal or situational. Besides, in most cases, the psychological factor, association, plays a crucial role. For example the symbol '>' in $d > t$ is ambiguous, as it may mean either d is greater than t or d has changed into t. An ambiguity can usually be resolved by specifying the context or other limiting qualifications.

3.2.3. Intensification

"Intensification" is a qualitative modification with three different functions: to emphasize (certainly, definitely, obviously, really, just); to amplify (absolutely, completely, most); to diminish (somewhat, a little); to minimize (a bit, hardly); to approximate (almost, nearly). This fact relates to so-called "referential ambiguity" when individuals attend to avoid "nominative deadlock", using for these purposes linguistic tools like nomination ("It is *kind of* a garden"), non-discrete quantity ("She is *about* 20 years old"), or additional attribution ("A girl is *fairly* pretty").

"Intensification" is often attained with modifiers: prefixes, suffixes, and boosters. Consider the Tagalog language as an example. Prefix *ka* means: 1) singularity ('katao' – "one man"); 2) possession to something ('kababayan' – "the habitant of the same town"); 3) possession to unification ('kabila' – "one of two sides"); 4) signification of equality ('kamukha' – "someone", "similar"). Prefix *taga* shows regularity of an action or a person being responsible for something: 'tagaluto' – "someone who is responsible for cooking". In the Laos languages, "intensification" depends on morphemic variation: ('jong jaang-jaang' – "very soft", 'jong jeeng-jeeng' – "mild soft").

"Intensification" or "deintensification" reflect "hedging"-strategy and overlap with the other phenomenon – "understatement" ("It is snowing in the mountains *a little bit*"); although "hedging" usually refers to speaker's attitude toward a speech act ("It is snowing in the mountains, *I suppose*") rather than to entire proposition. The distinction between "hedging" and "understatement" one may draw within trichotomy: understatement – downtoners – hedges: 1) understatement (Could you open the window *for a moment*?); 2) downtoners (Could you *possibly* open the window?); 3) hedge (Could you *kind of* open the window?). Mr Hübler supposes "understatement" to be of two kinds: phrastic (concerning to the whole proposition) and neustic (one's attitude to the part of proposition).

"Mitigation" is another stylistic tool for decreasing of a negative effect on the audience. (i) "Mitigation" occurs when a speaker tries to be polite to someone. (ii) "Mitigation" is not a speech act, but it changes its illocutive force. (iii) "Mitigation" is not "hedging", but "hedging" implies polite effect, too.

"Mitigation" embraces such phenomena as "accentuation" and "attenuation". An "attenuated" expression becomes "weak", indirect, or ambiguous (e.g. I suppose *in a sense* it is.), while an "accentuated" expression becomes exaggerated (e.g. I am *absolutely* convinced that …). Ambiguity appears by means of illocutive force. Some pragmatic markers can satisfy both "attenuation" and "accentuation". Ex.: the verb *to think* being dependent upon a context refers either to "attenuation" ("Particularly I *think* you probably like the sort of clothes I like anyway") or to "accentuation" ("I say I *think* they made up their minds before they started").

3.2.4. Quantification

Quantifiers are of various forms, so that their classification can be generally given schematized: "1) quantifiers of allness and non-allness (everybody, always, nobody, never); 2) quantifiers of singularity (only, exactly); 3) quantifiers of non-singularity (also); 4) quantifiers of full and non-full capacity of a set (everything, some, any, many, much, someone); 5) quantifiers of approximation (about, one, two); 6) quantifiers of descriptions (more, less, first)". Another gradation offers Polish linguist Mr Kiklevič. He found out that between separate subgroups of the Slavic languages there exists some differences in quantifiers; their semantic frequency in the East Slavic languages is realized through the lexical and morphological tools. In the other Slavic languages, there is a lack of such semantic correspondence within quantification.

"Quantification" as a part of "hedge"-strategy became an object of pragmatics. Consider a positivistic example: "How can we infer "All horses' heads are animals' heads?" from "All horses are animals"? Let 'Px' mean "*x* is a horse" and 'Tx' – "*x* is an animal" or (1) $\bigwedge x(Px \rightarrow Tx)$. It is a simple general statement of conditional form. The situation differs from that in the conclusion. Let 'Kyx' be abbreviation for "*y* is *x*'s head". Then "*y* is a horse's head" equals $\bigvee x(Px \bigwedge Kyx)$ ("there is an *x*, such that *x* is a horse and *y* is *x*'s head"). Analogically, "*y* is an animal's head" equals $\bigwedge x(Tx \bigvee Kyx)$. The statement (1) takes the form (2) $\bigwedge y(\bigvee x(Px \bigwedge Kyx) \rightarrow \bigvee x(Tx \bigwedge Kyx))$. Thus, (2) follows from (1). We may insist that the introduction of two-placed relation 'Kyx' is not necessary. As "*y* is a horse's head" is obvious, its form can be one-placed predicate 'My'. We may also write down 'Ny' for "*y* is an animal's head", so that the conclusion will look like (3) $\bigwedge y(My \rightarrow Ny)$. This statement is in no way linked with (1) by logical relations. What kind of an analysis is to choose depends upon the task we intend to resolve.

Finally, the distinction between singular and general statements with quantification rests upon the concept of relativity in the formal language. Mr Hempel gives an example: "The Earth has a ball-shaped form". The sentence is singular, if the concepts *the Earth* and *ball-shaped* are non-identical. On the contrary, the sentence is general in the languages where the predicate *ball-shaped* is to be defined by quantors.

3.2.5. Indexicality

"Indexicality" in natural language often correlates with egocentric coordinates "I"-"you"-"here"-"there". In the history of linguistics, "indexicality" developed from the verbal category, which usually treats as an essential feature of a narrative event (En), or its participants (Pn), or its relation to another narrative event (EnEn). Thus, EnEn is a relation between two events; PnEn is a relation between an event and participants; EnEns is an event based upon some communicative act Ens. In this case, we speak for shot of designators (Pn, En) and connectors (EnEn, PnEn, EnEns). The

first are subdivided into qualifiers and quantifiers. Both designators and connectors may be shifters (Pn/Ps, En/Es, PnEn/Ps, EnEns/Es) or non-shifters (Pn, En, PnEn).

Such division offered Mr Jacobsen, who later added to the verbal morphologic category "composed forms" and "syntactic idioms". For example, the structure of expression "they shout" is to be interpreted as "they are about to shout: they are expected to shout". These forms are in paradigmatic relations similar to "they shout – they will shout". If we put down the verbal category, we will see that "indexicality" in philosophy of language has special nomenclature overlapping with "hedging":

1) "indexical symbols" by Mr Pierce; index is a sign referring to the object;

2) "egocentric particulars" by Mr Russell; words whose signification depends upon speaker's attitude: *this, I, you, there, then, past, present, future*. The phrase "I am hot" and "John is hot" will have a definite meaning, if it is known the time this statement pronounced *ad hoc*. Or "I" means the biography of "this"; "here" means the place of "this", etc.;

3) "mots auto-referentiels" by Mr Benveniste: personal pronouns, indicators of deixis, indexical pronouns, adverbs, adjectives. They establish spatio-temporal relations around a "subject": *this, here, now, that, yesterday, in last year, tomorrow*;

4) "occasion sentences", "eternals", "standings" by Mr Quine; 5) "Dasein-designators" by Mr Heidegger; 6) "shifters" by Mr Jespersen; 7) "token-reflexive" words by Mr Reichenbach; 8) "indexicals" by Mr Goodman; 9) "indexical expressions" by Mr Bar-Hillel.

3.2.6. Negation

The nature of negation can be either philosophical (dialectical) or linguistic. Mr Heyting defines any negation intuitionisticly: "Strictly speaking, we must distinguish between "not" in mathematics and "not" in common language. As the statements "*p* is not true" or "*p* is false" are contradictory, we use in mathematics combinations "impossible that", "it is not the case that", etc., while the factual negation is expressed by the words *we assert that…, nobody knows that…*. Similarly, Mr Mannoury puts forward two kinds of negation – that of oppositive and excludative. Such terms as *finite, empty, general, real, death, problem*, etc., according to him, belong to both groups: 1) 'a' or 'non-a' = 'all' (principium terti exclusi) and 2) 'a' and (simultaneously) 'non-a' = 'nothing' (principium contradictionis).

In linguistics, gradual negation prevails over other types. In Latin, there are different negative particles *noli, nolite* for Futurum and *non* for Futurum I, instead of one *ne*. In Georgian, there are three negations – *ar* ("ar mova" – "will not come"); *ver* ("ver mova" – "cannot come"), and *nu* with the meaning of prohibiting ("Nu davcert!" – "Do not we write!"). In Swahili, the particle *ha*, attached to the verb, expresses the negation of indicative mood. The other particle *si* is applied for the negation of indicative and conditional moods: "Asisome" – "Let him not read"; "Asiposoma" – "If he is not reading". In the Baoansky language, there are four negative particles: *le, se, shi, gi*. The particle *le* is used a) with verbs in Future Tense in indicative

mood; b) with participles in Present and Future Tenses. The particle *se* takes place a) by the verbs in Pasts Tense in indicative mood; b) by the participles in Past Tense. The particles *shi, gi* mean “no”, “not”, “without”.

In Chinese philosophy, we find no abstract negation. Even if one looks for a word “to deny”, or “to negate”, the verb *fei* “to disapprove”, “to criticize” will not be used. However, we have comments where *fei* means “to deny”, “to reject” opposed to *li* “to establish”, “to assert”, “to put forward”. Today, the particles *pu* and *bu* are more common. Compare: 1. The “pu” negates a predicate in narrative sentences [(subject) – pu – predicate]. Ex.: Chun tzu *pu* chhi “The gentleman does not act as a tool/vessel”. 2. The “bu” corresponds to true negation “not” or ‘S bu P’. Ex.: *Ta bu chy* “He does not eat”.

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PART V
LANGUAGE OF METAPHYSICS

CHAPTER ONE
NATURE OF EXISTENCE

1.1. Language and Ontology

In ontology, we distinguish between essence and reality. Materialists extract them from outer world, idealists from mind, and phenomenalists from language. Suppose the world is looked at as one might look at a watch. In looking at a man, you infer that a man exists, and in looking at the world, you would infer that God exists. We realize that propositions "God exists" and "A man exists" operate under different opinions. "The man exists" refers to materialistic (realistic) philosophy, and "God exists" suits for a religious situation.

The old opposition East-West in this respect goes to traditional Chinese philosophy that concerns with a changing universe of seasons and cycles. To be, is to be in a certain way at a certain time. "Being" as "a thing-in-itself" is not extrapolated from a "way of being". The Greeks but abstracted "existence" from all that exists, and on the basis of "existence" assigned both "truth value" in judgments, and "axiomatic identity" in categorical propositions. One encounters the Westerner wondering whether or not God "exists", but not whether existence is "God". The Chinese principle of complementarity arises in change and in "Non-Being". The way, in which something is at a given time, is relative to change, i.e. "Non-being". If things change, they do so within the framework that "things exist" and not that "existence is things".

In contemporary Western tradition, "most theological conclusions are reductive. In other words, theology is more like physics than like mathematics. On the other hand, attempts to reduce the world to Unity, to God, to Self, to Nature fail. In this extreme case let number "1" mean the totality of the existent universe in the common acceptation of that term. Then "x + x=1" is of necessity, and with this necessity we stop. We cannot establish the existence of *x* only for demonstration, as we become involved in self-contradiction. For instance, let *x* stand for "God", then *x* will stand for "not-God" simultaneously. Now, if we try to demonstrate the non-existence of *x*, we shall continue in an absurd manner. An opponent of this argument might perhaps affirm that the human proof is as well regarded as a form of Divine reasoning. God would thus be proving His own exclusive existence".

The category of reality is less inclusive than the category of being. Therefore, we must exclude the real centaurs and real winged horses and real golden mountains from existence. Reality or reference to reality must be given in some concepts, but it cannot be given in any of them to which we attribute such a predicate. Reality cannot be defined in terms of a quality that can be made a quality of any entity.

Accordingly, there are two theories of semantic functions of language. The first is real semantic theory, while the second is conceptual realism. It considers concepts as conventional relation between a sign and an essence independent of language

signs. Plato raised a question, “How does an expression hold its meaning?” Naturalism assumes that there exists natural affinity between sounds of a word and its meaning. Conventionalism rests on social attempt to cover words with appropriate meaning.

Based upon ontology, Mr Carnap supposed language essences to be existent and its significations to be bound variables. The sentences “Electrons exist” and “Electrons have negative charge” are then of the form, “There exists *x* such as *x* is an electron” or “For every *x*, if *x* is an electron, *x* has negative charge”. Mr Carnap assumed that every language has so-called “universum of discourse”, a set of U-essences. But if “universum of discourse *S*” is a set of living creatures, the existential sentences in *S* will be indefinite. For we will distinguish the question like “Are flying dogs existent?” from that of “Are living creatures existent?”

1.2. Logic of Existence

Ontology is that philosophical study which concerns the question “What does exist?” The same question appears in other sciences. In mathematics, one may ask if there exist natural numbers *x*, *y*, *z* for the equation $x^n + y^n = z^n$, where $n>2$ (the famous Fermat’s theorem). Thus, existential questions are usually of two forms:

(1) Does a thing with property *F* exist?

(2) Does a thing *a* exist?

The question of the form (2) is problematic if proper names do not denote an object. Mr Quine offers to substitute them by the predicates. In his case, the proper name *Pegasus* has been substituted by the predicate *to pegasize*, reducing the problem of proper names to the question of the form (1).

According to Mr Carnap, there are external and internal existential questions. We may not ask, “What does exist” but “Which language do we have to choose?” Every existential sentence is meaningful in *L*, if “universum of discourse” defines it. Hence, the sentence “*A* does not exist” or $\neg Vx(x=a)$ is false or meaningless in *L*. Of course, in *L* one can speak of non-existent objects. If we distinguish between virtual objects and real objects, we will understand the sentence “*A* does not exist” either in the sense “*A* is a virtual object” $\neg Vx(x=a)$ or in the sense “*A* is a non-valid object” $\neg V.x(x=a)$. In both cases, the object refers to ontology of *L*.

We see that every statement of the language must have a sense, e.g. “Three is a natural number”, “Iron is a metal”. Yet the rearrangement gives a paradoxical result: “The number three is a metal”; “Iron is a natural number”. Positivists will speak in this case of logic of things (Sachlogik). Indeed, in axiomatic systems it is rather difficult to draw boundaries between meaningful and meaningless statements. In mathematics, “existence” has the form $\exists(x)a(x)$, so that we cannot build the sentence like “David exists” because “David” is not a property but a name; “the world” is constructed in mathematics without names. As a result, “to exist” means “to be built”.

At that very moment when Aristotle separated *what*-sentences from *that*-sentences, existential statements are the statements about properties. But neither Mr

Hume, nor Mr Kant holds the predicate *to exist* as an attribute because existence is a mere predicate's substitution. Mr Mill and Mr Brentano did not see the similarity of "A is" and "A is B" at all. Mr Brentano assumes that spiritual properties refer to some object at the moment of saying "A is" or "A is not". But with the sentence "…that is A" or "…that is not A" we express existence and not objects. Mr Brentano denies this fact, proposing to pass from imagination to the statement, which equals the object *a*.

K a n t's c r i t i q u e. (I) "Existence" is a logical and not a real predicate. (II) Even if we do not accept (I), the premise "the greatest Being implies existence" is arguable; it implicitly requires the establishment of its subject or (∃x)(*x* is God), but existential quantor ambiguously entails the real existence. Mr Kant tried then to adjust "is" to the function of copula. He found that the singular statements cab be hypothetical or universal without any existential conclusion. In his "Critique", the singular statements seem to be similar to Aristotelian universal statements, i.e. (1) (∃x)(*x* is God) · (x)(*x* is God ⊃ *x* is existent) or for short (∃x)(*x* is God ⊃ *x* is existent).

Kants' contemplation was not to reveal whether "existence" is a real predicate. He pretended to objective and not logical truth. By postulating this predicate *eo ipso*, it is always possible to deny existence. Of course, analytical statements as hypothetical ones can rest upon contradiction. Yet, the statement (∃x)(*x* is God) is not a part of this form; its negation is not a contradiction. As a result, Kant's critique of ontological argument led him to the doubtful idea of distinguishing synthetical and analytical sentences.

Putting aside Kant's prejudice, we will not deny that in common speech such sentence as "Tame tigers exist" may be used as an absolute property and that the word *exist* is a predicate, i.e. in the position of an attribute. But Mr Kneal supposes that if "to exist" takes the place of the verb, it is not a predicate. Kneal's argument consists of two parts. First, he says the sentence "Some tame tigers exist" is similar to "Tame tigers exist", i.e. "Some S are P" equals "SP exists", "a is SP", "b is SP", etc. Second, the predicate *to exist* does not occur in disjunctive sentences.

We see again how Mr Kneal, like Mr Kant, makes fatal mistakes. Even if the proposition "*p* is true" equals *p* in which "true" does not occur, it does not mean that "true" is not inclusive into the predicate in "*p* is true". The second failure is an attempt to establish some equivalence. But existential statement is not equal to a disjunctive singular statement. Thus, Mr Kneal opinion that "to exist" is not a predicate fails.

We may conclude that if the sentences "Tigers exist" and "There exist tigers" refer to the same thing, then the statement "There are tigers which exist" is superfluous, and the sentence "There are non-existent tigers" is self-contradictory. Thus, the positive existential propositions are tautologies while the negative existential propositions are self-contradictions, if "to exist" is taken as a predicate. The positive and negative propositions are in this case categorical. If the predicate *to exist* is universal, then every essence implies existence, so that if "Gx" denotes "*x* is God", then (x)(Gx⊃Ex).

1.3. General Proof of God's Existence

Philosophers maintain such propositions as "Time is not real" or "There are no physical objects". But they also assure us that "we do not err when we perceive physical objects such as stones and trees".

Words such as "existence", "reality" usually do not occur without scientific theories. It does not matter whether the concepts used in the theory are abstract or not. Observable things are often said to exist. The ontological problem however has no place in science. "To exist" is not a predicate like "to fly". To say "The table exists" is not similar to saying "The bird flies". For the last sentence may contain an adverb, e.g. "The bird flies swiftly", while "The table exists" is a sentence that cannot be qualified.

After all these preliminaries discussed, if one intends to find within the theory of cognition eternal objects, he/she must accept either the concept *matter*, or the concept *God*. From ontological point of view, we have to clarify whether the sentence "God exists" or "There is a divine Being" one holds for analytical in the same manner as "The square has four corners". And if we agree with Anselm's assumption that "the real existence" is greater than "the thinkable one", God would be put into [really existent]. Whether it strictly matches real object's existence is another question. Nevertheless, logic allows us to grasp this problem in details.

(1) God is the greatest Being, so that we cannot imagine anything greater than God;

(2) If God does not exist in Reality as necessity, then we can imagine something greater than God;

(3) God exists in Reality.

Let formalize the predicates GR (x, y) and E(x) as GR (x, y). Thus,

(1) $\neg\exists x$ GR (x, g); (2) $\neg E(g)\rightarrow\exists x GR(x, g)$; (3) E(g).

We used two kinds of signs – the logical symbol '∃' and the predicate 'E' – to define the real existence of *x*. The sign '∃' in (2) is referring to existence of the arbitrary chosen *x*. The predicate 'E' in $\neg E(g)$ denotes the non-existential 'g'. Our formalization is valid, if the premises (1) and (2) are true. But if they are *a priory* false, we seem to have no sense to prove God's existence. This conclusion is but premature because premises in a syllogism taken apart are positive; and it will be sufficient to demonstrate them separately.

1.3.1. Aquinas' Argument

There exists a long-standing tradition of cosmological God's proof. Aquinas' arguments are among them. We will consider two last Aquinas' proofs in which God is being understood as a mover of everything or "the first cause".

a) There is the first cause; b) The cause of object's existence is another object; c) The chain of causes for object's existence a_n (i.e. a set ..., a_3, a_2, a_1, where a_n is a

cause for existence of a_{n-1} (n>1)) is finite; d) Thus, there exists an Essence or God, which entails existence of other objects.

Traditionally, the causes are objects. Yet today we do not say, "A carpenter is the cause for table's existence" but "The carpenter's effect is the cause of table's existence". Analogically, the God's effect is then "the first cause". The proof transforms into (see works by Mr Kutschera)

a') There are event-causes; b') The cause differs from the effect; c') The chain of event-causes E_n (i.e. a set ...E_3, E_2, E_1, where E_n is a cause of E_{n-1} (n>1)), is finite; d') Thus, there is the first cause.

The premise a') justifies God's existence empirically, while b') expresses the irreflexivity of the relation between the cause and the effect, so that the relation "cause-effect" is transitive. Aquinas's argument for c') is that "If there is no first cause, then there is no second or third cause, too". But this premise seems to contradict a'). However, among the infinite amount of natural numbers (…-2, -1, 0, 1, 2,...) there are also no first, second, or third numbers; and it does not mean there are no natural numbers at all. Aristotle derives c') from the assumption that the effect disappears with its cause, so that all the (medium) causes exist with their effects. The infinite chain of causes serves for existence of the infinite set of events, but Aristotle does not presuppose such infinity. The same position takes Mr Aquinas by the distinction between the necessary (essential) and accidental causes.

<u>God as necessity</u>

a) Everything exists as contingency or necessity;

b) Everything that exists once appeared;

c) Everything appears from something;

d) If everything exists as necessity, then there was a moment when Nothing existed;

e) But Nothing could not have appeared;

f) Thus, there is something existent only as necessity; we call it *God*.

In general, (a)-(d) say that something is existent but not has been existent or will be existent. Mr Clark gives such an argumentation: "Let *M* be a definition through some kind of a fact and not a reason. The appearance of an object from *M* has a cause in *M*, but there are no objective reasons for it".

Against this Clark's argumentation, one may say that if the objects appeared from *M*, then we can find out why they appeared, although from the premise "For every object *x* from *M* there is an explanation" does not follow the universal conclusion "There is an explanation that all objects appeared from *M*". Thus, Mr Clark as well as Mr Leibniz used here an obscure principle of Sufficient Ground.

1.3.2. Anselm's Argument

Mr Anselm's proof of God's existence consists of four parts. In the first, he defines God as something whose greatness cannot be imagined. In the second, God exists in our mind. In the third, God ought to exist in reality. In the fourth, Mr Anselm

puts the second and the third results together by using identification words, which feature an object through the description "the President of the USA in 1990" and the like. In God's proof, such an expression was "there is nothing greater".

a) God is the greatest Being (1);

b) This Being exists in mind (2);

c) If God had not been existent in Reality but only in mind, then there would be existent something greater (than God), i.e. there would be no God (3);

d) God exists in Reality.

The premise (1) denotes the concept *God* in the similar way as that by Augustine and Seneca. It concerns the definition, which recently means, "God is a (maximum) perfect Being". The premise (2) means, "It is possible that there is such a Being", or "There is an object to which this concept (Being) is applicable". The premise (3) is based upon the principle by which "an existent object is more perfect than non-existent". Possible but not real Being cannot be God in the sense of (1). As the perfectness implies omniscience, there must be no other Beings.

Critique:

The attribute of the "perfectness" is problematic because we cannot see why Achilles who is living now is "more perfect" than the fictive one by Homer. For Mr Anselm, the premise (3) is analytically true; thus, God exists and existence is an attribute. Mr Gaunilon tried to use this lack for his attack on Anselm's proof. He said, "A perfect (beautiful, fruitful) island exists in mind. If it had not been existent in reality, it would not be perfect. Hence, it exists".

(AI) Reconstruction by Free Logic

In free logic, one may use names to define the non-existent objects. Then God's proof is thus (see works by Mr Kutschera): 1) Gx: = ¬Vy(x<y), 2) VxGx, 3) ⋀x(¬Ex⊃Vy(x<y)), 4) ⋀x(Gx⊃Ex), 5) Vx(GxEx) (or V.xGx).

Some problems immediately arise by this reconstruction. The definition (1) is arguable because it remains unclear how the definition "*y* is greater than *x*" is being understood. The premise (2) is wrongly justified; from the predicate 'Gx', it does not follow the existence of a possible object this predicate refers to. One may merely say, "If the predicate 'Gx' denotes a concept, then it exists in mind (*in intellectu*)". If we show that MVxGx (M stays for "possible") is valid, the premise (2) will be superfluous because MVxGx says that there exists an object with an essential property "to be God". The form VxGx, however, "insists upon" the existence of a possible object, thus God, in the *real* world [1]. The premise (2) follows from MVxGx only when 'Gx' (or x<y) is an essential attribute. That is why Mr Anselm passed to a stronger conclusion NV.xGx proved in "Proslogion III".

Now, from "All gods exist" we come to "There exists (one) God", i.e. to V.xGx. Mr Gassendy in his critique of ontological argument said, "To define God through (1), one must firstly reveal that there is God at all; but then the rest of the proof is not necessary". However, we cannot criticize Mr Anselm for the false step from (4) to (5), if we understand (4) in the boundaries of contemporary logic. Otherwise, we

[1] If we may speak of reality at all.

would mix "existence" as 'E' with "existence" as 'Vx'. For Mr Anselm, the premise (2) is inconsistent by such a false conclusion.

(AII) Reconstruction by Modal Logic

In modal logic, quantification of possible objects is defined through the symbols 'Vx' and '⋀x'. The second Anselm's reconstruction, according to Mr Kutschera, looks then like: 1') Gx: = ¬MVy(x<y), 2') MVxGx, 3') N⋀x(¬Ex⊃MVy(x<y)), 4') N⋀x(Gx⊃Ex), 5') N⋀x(Gx⊃NGx), 6') MVxGx⊃MVxNGx, 7') MVxNGx, 8') MNVxGx, 9') NVxGx, 10') NVx(Gx⋀Ex) (i.e. NV.xGx).

The main idea of (1') is independent of the definition of "God". The premise (3') equals (3) in A(I). (4') logically follows from (3'); (5') from (1'); (6') from (5'); (7') from (6'); (8') from (7'); (10') from (9') and (4').

It is to say that the premises (1') and (3') are unreliable as well as (1) and (3) in A(I). For the premise (2'), we must reveal that "G" is non-empty from analytical grounds, i.e. there exists a possible world in which VxGx is valid. If God is being defined in the sense of (1'), His existence is possible when it is necessary. Hereof, it will be non-analytically possible that God does not exist. Moreover, one may say that neither God's existence, nor God's non-existence is analytically impossible. From the premise (4'), we conclude that only necessary existence is true God's property.

(AIII) Reconstruction with Indexicals

Mr Anselm in his last argument suddenly makes a step from the definition "aliquid quo maius cogitari nequit" to "id quo maius cogitari nequit". If the first one is 'Gx', then the second will be 'ιxGx'. The variable *x* in 'ιx' refers to the possible objects; thus, 'ιxFx' is a possible object with a property *F* or ιxFx: = ιx(Fx⋀Ex). If Mr Anselm interprets "aliquid" as an index, his argument transforms into 1") g: = ιx¬Vy(x<y), 2") Vx¬Vy(x<y), 3") ⋀x(¬Ex⊃Vy(x<y), 4") ⋀x(¬Vy(x<y)⊃Ex), 5") E(g).

(B) Reconstruction by Analogy with First Argument

The second argument whose strong conclusion says that God necessary exists, one may again formulate in three versions. This reconstruction is rather simple, if the premise (3) in A(I) is replaced by (3a) ⋀x(¬NEx⊃Vy(x<y)), or by (3'a) ⋀x(¬NEx⊃MVy(x<y)) in A(II). Thus, we get (4a) ⋀x(Gx⊃NEx) or (4'a) N⋀x(Gx⊃NEx). The final reconstruction for A(I) will be 1) Gx:= ¬Vy(x<y), 2) VxGx, 3a) ⋀x(¬NEx⊃Vy(x<y)), 4a) ⋀x(Gx⊃NEx), 5a) Vx(Gx⋀NEx).

1.3.3. Leibniz' Argument

Mr Leibniz proposes a version of God's proof in which the concept "necessary existence" replaces that of "the greatest perfectness": a) God necessary exists; b) It is possible that there is such Being; c) There is God. The conclusion (c) is monadologically derived from the premises (a) and (b), but (b) is incorrect. Mr Leibniz wrongly proceeds from the assumption that the sentence 'A' does not entail the contradiction with the form "It is analytically possible that *A*". He shows only that if (b) is valid,

then (c) is also valid. However, many objects may necessary exist. The reconstruction of (a)-(c) must be thus: 1) Gx: = NEx, 2) MVxNEx, 3) VxNEx.

The premise (2) results from the fact that VxNEx seems to be inconsistently. Nevertheless, it does not mean that the full sentence MVxNEx is true in all interpretations. One may merely say, "If *V* is an interpretation and if the sentence VxNEx is non-analytically false in *V*, i.e. there are worlds where it is invalid, then MVxNEx must be analytically true in *V*". By choosing such interpretations, we define that MVxNEx is sufficient, although it is not obviously true or provable, as we have seen. Mr Leibniz only shows, "If the premise (2) is correct, then the conclusion is correct, too". It is a modal-logical truth because VxMNEx follows from MVxNEx (in logic S5). Thus, we get VxNEx. However, if we choose another interpretation, say V_1, in which there are necessary existent objects, then we have N¬VxNEx, i.e. ¬VxGx will be also analytically true that contradicts our theory.

We must choose such interpretation where there is an object which is not a person or a plant but namely God. In this case, we conclude in advance that God exists. The complete Leibnizian argument is 1) ¬MVxNEx⊃¬MVxEx, 2) MVxNEx⊃ VxNEx, 3) ¬VxNEx⊃¬VxEx, 4) VxEx, 5) VxNEx.

The premise (2) (in logic S5) is a modal-logical sentence; (3) follows from (1) and (2); (4) and (3) entail (5). However, the premise (1) seems not to be true: from ¬MVxNEx (in logic S5) only follows ⋀xM¬Ex. But Mr Leibniz does not make a logical mistake. The premise (1) implies the principle of Sufficient Reason according to which everything that is necessary existent must have a reason for existence in the other necessary object (in *ens a se*). From (*) VxEx⊃VxNEx, however, follows MVxEx⊃MVxNEx. Thus, Mr Leibniz would reveal a *real* definition of God's existence. In this regard, Lebnizian argument is reconstructed as follows: 1') VxEx⊃VxNEx, 2') MVxEx⊃MVxNEx, 3') MVxEx, 4') MVxNEx, 5') MVxNEx⊃ VxNEx, 6') VxNEx. Here the premise (1') is the principle of Sufficient Reason (*) which implies (2'); (3') is a weak premise (4'); (4') results from (2') and (3'); (5') is a true modal-logical sentence; (6') follows from (4') and (5').

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ADDENDUM

Discussion of the Monograph

**"Science and Language.
Experience of Logical Empiricism"
by A.P. Maryukhin**

Astrakhan Scientific Library
November 2016

Participants:

Author, PhD *Maryukhin A.P.*;
Library official *Mitalyova M.*;
Research assistant *Savin Ya.*;
Senior assistant *Zakharov D.*;
the audience of students.

Mitalyova M.: Dear friends! Our library is glad to introduce a new book by Mr Maryukhin Aleksandr. The author has personally visited us to tell about this exciting event. After presentation, everybody is welcome to take part in free discussion.

Maryukhin A.: Thank you for invitation and for giving me a chance to express my attitude toward everything involved into my hard and deep work. As you know, today is the 14th of November, World Philosophy Day. It emphasizes the importance of our collaboration once again. It was a long way to publish my book but I have taken as I mean right decision. The publishing house "Progress-Tradition" in Moscow kindly agreed to help me. Now my book is in deposit in biggest libraries of Russia and even abroad in Princeton University Library, Library of Congress and Chicago University Library.

My work is rather extensive. It embraces many fields of science. Especially, it concerns the themes about the basic role of language and the real nature of experience (or the world). It clarifies whether the objects of knowledge are similarities (universals) or differences (particulars), whether "reality" is permanent or changing, etc. Consideration of such metalinguistic "assignments" should render those generalizations about nature upon which certain kinds of scientific metaphysics are made to rest.

The analysis of science usually begins with its consideration as a specific kind of activity. Scientific knowledge represents difficult, contradictory process, which forms the complete developing system of concepts, theories and hypotheses, fixed in language both in natural and artificial. One of the criteria for successful communication within science is the concept of incommensurability.

The word *incommensurability* became the exact sense in the Greek mathematics: two pieces of the length are commensurable, if [for some *n* and *m*] *m*-pieces of the first length equal *n*-pieces of the second length. But not all lengths are commensurable. For example, the diagonal of a square is not commensurable with its part. The incommensurability of problems means that each fundamental theory applying for the description and explanation of the same facts can also investigate the other tasks, use new concepts and have the application other than the previous one. The third type of incommensurability is philosophical and presupposes incommensurability of senses. In case of strong theories, any definition will include theoretical terms. Individual terms in the theory depend upon the situation in the structure of the theory as a whole. For example, scientific theories consist of statements, so that it is possible to carry out difference between two types of universal synthetic statements used in scientific knowledge – "strictly universal" statements and "numerically universal" statements. When Mr Popper speaks about universal statements, he stresses the importance of strictly universal statements of theories or laws of the nature. Numerically universal statements equal certain singular statements or their conjunction.

Mr Popper compares two statements: (a) "For all harmonious oscillators it is true that their energy never falls below a certain level (namely *hv/2*)"; (b) "For all human beings it is true that their growth does not exceed some certain size (say, 8 feet)". Formal logic (including symbolic logic) which is interested in the theory of deduction considers both of these statements as universal ("formal" or "general" implication). Mr Popper believes that it is necessary to emphasize difference between them. The statement (a) is valid in any place and at any time. The statement (b) belongs merely to the final class of specific elements and to individual (or separate) existential area. The statements of this last sort can be replaced with conjunction of singular statements. It explains why in such cases we speak about "numerical universality". At the same time in the statement (a) the oscillators cannot be replaced with conjunction of final number of the singular statements relating to final existential area. This replacement would be possible only at that assumption that the world is limited in time and in number of oscillators. Dealing with such methodological situation, Popper applies for "general statements" (strictly universal) the following form: "For all points of space and time (or in any existential area) it is true that..."

Thus, the description of scientific theories is involved into various philosophical processes. Modern physics of microcosm is connected with application of the existing quantum theory to electrodynamics of "elementary" particles (electrons, protons, etc.) that causes internal contradictions in the theory, which assigns infinite value to various physical elements, for example, weight and charge of electron. This infinity arises from assumption that "elementary" particles, for example electrons, are geometrical points. But if particles have a structure, then it means that they occupy some volume and cannot be considered as geometrical points. Similar contradictions appear either by specification of scientific methods or by usage of natural language tools. This second criterion is more perspective during the era of relativism and quantum physics.

Savin Ya.: As I have rightly understood, all troubles in science are because of language, and the merely possible way to cover these problems is to make logical analysis. But how logic being far from reality is capable to demonstrate what wrong is and what false is?

Maryukhin A.: To answer this question, I will follow the opinion expressed by logical positivist Mr von Mises: "The question whether logic rests upon experience or originates in the human mind independently of all experience is wrongly posed. For example, we observe that there are things which are black and things which are not black. But this distinction is not strict, the disjunction is incomplete, and we cannot even circumscribe precisely the range of objects to which it applies. This observation led us to create the logical relation of A to non-A, which after suitable agreement about the use of the signs is free from uncertainty and vagueness. The same is true for the other relations of logic – the disjunction, conjunction, etc. They are abstracted from experiences in which they are realized only approximately"[1].

Moreover, that which is represented by the simple apprehension or the term is never found out of the mind, isolated and by itself. For example, that which we call "red" does not exist objectively by itself, but naturally conjoined with a "something which is red". I am referring now to one good example.

"How we use a word, i.e. what we mean to refer to by using it, is largely determined by the situations in which we have met the objects to which the word refers. Class-names enable us to abbreviate and to connect. The psychological reasons which make the invention of such words as *taxicab* and *Bolshevik* useful also lead to the specially devised terminology of a special science. The chemist finds it useful to speak of "carbon monoxide" and "carbon dioxide" and even to abbreviate further by using the carefully devised symbolism CO and CO_2. Formerly (about 1630) carbon dioxide was called "gas sylvestre"; later (about 1754) it was called "fixed air". Each of these names is significant; the former of its discoverer, the latter of one of its properties. The name *carbon dioxide* is, however, more importantly significant to the chemist in showing the way in which this gas is composed"[2].

Zakharov D.: The rules of classic language of science can be defined. But will the transition to a new system give us new rules?

Maryukhin A.: This problem concerns, first of all, the transition from language of Newtonian mechanics to language of quantum physics in which there are additional stochastic phenomena, other modality and other understanding of the subject. In mechanics, the primary words *gram, metre, second* refer to physical standards of mass, length, and time. Other scientific words such as *velocity, momentum* are defined in terms of these primary words and through them they are connected to the physical things. Additional words could be invented and used instead in quantum physics. But for its general scientific use, a word such as "metre" is correct for the physical standard of length in both systems; there is no question of this word is being a good choice.

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[1] *Mises R. von*. Positivism. A Study in Human Understanding. – N.-Y., 1951. P. 123.

[2] *Stebbing S*. Logic in Practice. – London, 1934. Pp. 15-16.

Drawing another positivistic example, we may also say "the motion of a single falling body can be described in a primitive way. However, if one wants to describe all motions of falling bodies collectively, one must decide whether he/she finds in the Galilean or the Newtonian, or the Einsteinian system of correlation. The advance in any case lies in the fact that the description as a whole has become simpler, shorter, and more comprehensive".

The words *light, heat, sound* also have two distinct meanings. These terms imply at one time physical phenomena, the objective fact, at another time sensation and perception, or the subjective facts. "For example, "weight", which is a relation between different masses of matter, was in past times naturally regarded as a property inherent in any single mass. More commonly, however, there is a deliberate ignoring of the known elements of the relationship; thus the ancient Greeks gravely discussed Beauty as though it were a property of particular objects, or even existed independently; whereas it can be known by experience only as a relation between an object and its admirer"[1].

Zakharov D.: The same obstacle occurs in psychology where there are field concepts, which change initial concepts of objectivity, subjectivity, provability, improvability, atomic and compound statements. In the field, there is only a field. There are no habitual units of language here. The question arises "How do primitive nations perceive the world and how does it correlate with reality? Is it the same reality like that of physicists described by different languages or is it different realities?"

Maryukhin A.: Knowledge is not a simple approximation to "truth" or "reality". It is an interaction between a person and knowledge. This leads to a "perspective philosophy" for which physics is not a monopolistic way of knowledge. Apart from reductionism and theories, declaring that "reality is nothing but a heap of physical particles", we see science as one of the "perspectives" with social, biological, cultural and linguistic endowment. In this respect, inhabitants of Amazonian region or other primitive tribes somewhere else have that advantage that they possess more words to express the visible world. And we possess more words for abstract entities. A question arises why we must explain them something that we do not understand completely. They say what they perceive, but we always refer to transcendental essences. It is strange, I suppose.

Zakharov D.: They just catch us at this moment; we know everything about the world, but you do not understand us because you find contradictions. Why are there so many meanings at the word *mountain*? Because it identifies a condition, we cannot perceive. Through rituals, primitive men avoid contradictions, wars, scandals, and nervous diseases. It is rather simple.

Mitalyova M.: Our discussion is approaching completion. We are limited in time but not in passion to philosophical investigations. We hope to see all of you in the nearest future. Thank you once again.

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[1] *Shann G.* The Evolution of Knowledge. – N.-Y./Toronto, 1922. P. 78.

A.P. Maryukhin

CHRISTOLOGIE IM SPIEGEL DER SPRACHE

Christologie umfasst zwei Aspekte. Der erste betrifft die Wahrhaft der zwei Propositionen: “Christus ist Gott” und “Christus ist Mensch”. Der zweite betrifft die Vereinbarkeit dieser Propositionen. Die zwei Behauptungen “Christus ist Mensch” und “Christus ist Gott” sind einenader *prima facie* gegenübergestellt. Aber wir können nicht sagen, dass sie gleichzeitig wahr und logisch kontradiktär sind[1].

Ein Mensch ist *suppositum in natura rationali.* Doch wird das ihn nicht von der Weltnatur im allgemeinen Sinne unterscheiden. Die menschliche Natur von Christus ist einzigartig, keine platonische Abstraktion. Wenn wir sagen, dass Christus eine menschliche Natur aufweist, bedeutet es nur, dass der Satz “Alle Menschen haben Fleisch und Blut” dem Satzt “Christus hat Fleisch und Blut” völlig entspricht. Das bedeutet nicht, dass das Wort “Mensch” in “Christus ist Mensch” etwas Anderes als Christus selbst ist. *Ein Mensch,* soweit es die Bedeutung von *suppositum* enthält*,* ist ein formaller Begriff. Zu sagen “Christus ist Mensch”, ist dann gleich zu sagen, dass das Wort “Christus” ein Eigenname ist.

Wenn wir fragen “Was ist eine Subtanz eines konkreten Menschen wie Jesus Christus?”, sichert die Theorie der Definitionen, dass wir *τὰ ἴδια* als eine formale Substanz interpretieren. Haben zwei Individuums das gleiche *ἴδια*, so müssen sie notwendigerweise als *ὁμοούδιος* und *ὁμοφνής* verstanden werden. Christus befindet sich zwischen diesen Beschränkungen der heiligen und natürlichen Substanz. Wenn wir Christus mit Engeln vergleichen, ist das keine Vergleichung *τὰ ὁμοειδῆ*. Die Substanz von Sohn ist gewiss transzendental, aber diese Vergleichung ist gleich der Opposition zwischen Begriffen “ein Mensch” und “ein Pferd”. Ein Mensch ist “grösser” als ein Pferd kraft seiner Razionalität. Änlicherweise sind Christus und Moses verschieden in ihrer Natur. Christus ist *ὁμοούδιος* mit dem Vater, aber er ist der menschlichen Natur gleichzeitig. Sein Körper, Blut und die Seele sind *ἴδιον* in der Welt. Deshalb ist der Körper die Eigenschaft des Wortes sowie der Duft ist die Eigenschaft der Rose. Um dieses Argument zu verstehen ist es notwendig parallele Aspekte mit propositioneller Logik zu ziehen. Betrachten wir den Satz “Ein Mensch ist ein Tischler geworden” als ein Beispiel.

(a) Ein Mensch ist “ein Tischler”, weil er ihn geworden ist;
(b) Er hat damit nicht beendet, einen Menschen zu sein;
(c) Solches Wesen ist ein Mensch und ein Tischler in Einem;
(d) Ein Mensch als ein Tischler bleibt doch ein selbstständiges Wesen.
Daraus bekommen wir:
(a_1) Das Wort heisst “Gott”, weil es ist, was er geworden ist;

[1] Below we concern the article by *Williams C.J.F.* A Programme for Christology // Religious Studies, 1968. № 3.

(b_1) Das Wort hat nicht beendet, den Gott zu sein, nachdem Er einen Menschen geworden ist;

(c_1) Solches Wesen ist Gott und Mensch in Einem;

(d_1) Das Wort als ein Körper (Ding) ist ein selbstständiges Wesen.

"Das-Wort-seiend-ein-Körper" ist voller grammatischer Subjekt. Die Schwierigkeit besteht darin, dass diese Einigkeit ausser Empirismus auch logisch wahrhaftig ist, und wir haben dieses Phänomen in anderen Begriffen zu erklären. Ein dieser Begriffe ist "Komplementarität" in der Physik. Einige Beispiele hat Herr Bohr eingeführt, welche christliche Natur widerspiegeln: (a) ein Atom ist die Welle einerseits und die Partikel andererseits; (b) ein Lebewesen is der Organismus einerseits und der Atomkomplex andererseits; (c) ein Mensch selbst ist der Körper und die Seele. Christologie behauptet, dass ein Mensch "ein höhes Wesen" in Christus ist. Christus ist Mensch und Gott sowie ein Atom ist die Welle und die Partikel. Wie zeigt dieses Schema epistemologische Natur von Christologie? Herr Kaiser schlägt folgende Erklärungen vor[1]:

(1) *Einigkeit der Existenz*. Die Modi "die Welle" und "die Partikel" gehören zu demselben Objekt. In klassischer Christologie gehören die Modie des Gottes und des Menschen zu derselben Person (*hypostasis*) oder demselben Wesen (*physis*), Jesus Christus.

(2) *Gleiche Eigenschaften.* Zwei Modi haben gemeinsame Eigenschaften. Im Falle des Atomobjektes sind das die Restmasse, elektrische Ladung und der magnetische Moment. Im Christus sind das die Attributen des Lebens und der Persöhnlichkeit.

(3) *Individualle Gesamtheit.* Christus isi nicht zu sagen "Halbmensch" und "Halbgott", aber "absoluter Mensch" und "absoluter Gott". Gleichenfalls ist ein Atomobjekt weder "Halfwelle" noch "Halfpartikel", aber ihre absolute Einigkeit.

(4) *Vollkommenheit.* Nicht nur zwei Modi sind "voll" individuell, aber auch gemeinsam. Mit anderen Worten, ein Atomobjekt ist nur "die Welle" und "die Partikel"; Christus ist nur "God" und "Mensch".

(5) *Gleiche Notwendigkeit.* Zwei Modi sind notwendig für das Naturverstehen. Ein Atomobjekt ist gleich "die Welle" und "die Partikel"; Christus ist gleich "God" und "Mensch".

Ein traditioneller Christ muss verschiedene Chistuseigenschaften einnehmen, wenn er Christologie frei von logischen Paradoxen betrachten will. Man unterscheidet dabei zwischen Begriffen "einen Menschen" und "nur einen Menschen" zu sein[2]. Im ersten Falle bedeutet es einen Grad oder eine Klasse, welche heilige Natur aufweist, während im zweiten Falle ist das unmöglich zu beweisen.

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[1] *Kaiser Ch. B*. Christology and Complementarity // Religious Studies, 1976. № 12.

[2] *Durrant M.* The Logic of God Incarnate // Religious Studies, 1988. V. 24. № 2.

A.P. Maryukhin

"HECKENAUSDRUCK" ALS MODERNE SPRACHERSCHEINUNG

Die Sprachkommunikation ist der Informationsaustausch zwischen Menschen mittels eines gemeinsamen Systems von Symbolen, insbesondere Sprachzeichen. Sie besteht meistenteils aus zwei Seiten. Die erste – indirekte Kommunikation – tritt als "Mangel" der Exaktheit und Eindeutigkeit der Sprachzeichen auf, sowohl im Text als auch im ganzen Sprachsystem, was mit der unzureichenden Sprachformalisierung und dem menschlichen Faktor verbunden ist. Die zweite – direkte Kommunikation – ist dagegen solche, wo der *Sinn* einer Aussage mit der *Bedeutung* zusammenfällt, d.h. die fixierte Bedeutung des Wortes im Wörterbuch entspricht dem resultierenden kommunikativen Sinn. Hier wird die Sprachrede dem geschriebenen Text gegenübergestellt.

Der akademische Diskurs gehört zur institutionellen Kommunikation und wird als verbales Verhalten eines Subjektes (Forschers) zum wissenschaftlichen Gebiet verstanden, wo bestimmte soziale, historische Bedingungen und fest angenommene Stereotypen und Handlungen gelten, welche in wissenschaftlichen Texten als besondere Sprachmarkierungen auftreten.

Die Komponenten der indirekten Kommunikation enthalten sich im linguistischen Phänomen "Hecke/Heckenausdruck" oder „hedging", welchem man nicht nur „shields", Intensifikatore, Quantore, sondern auch linguistische Variablen mit Modifikatoren zuschreibt. „Hedge-Markers" dienen der semantischen Organisation eines akademischen Textes und erfüllen in einigen Fällen die Rolle der Sprachmilderung des Gesagten (Geschriebenen), in anderen aber werden sie als Mittel der Kategorisierung verwendet. Das alles ist durch Folgendes bedingt:

(I) Für die Wissenschaft ist es sehr wichtig ein solches Forschungsverfahren zu finden, welches der objektiven Realität in vollem Maße entspricht. "Hedging" erleichtert Kommunikation, aber führt insgesamt zu tiefen philosophischen Problemen.

(II) „Hedging" ist ein vielfältiges, aktives Phänomen. Es umfasst eine Vielzahl von Arten und Typen der Sprachmittel. Als Objekt der Linguistik ist „hedging" mit diskursiven Wörtern repräsentiert und als Objekt der Wissenschaft mit Variablen und Metaoperatoren.

(III) Die Formalisierung linguistischer Variablen stößt auf Schwierigkeiten mathematisch-philosophischer Natur. Das Problem der Mehrdeutigkeit in der „Fuzzy-Menge" hat mit Unvollständigkeit von Theorien und Sprachanthropozentrismus zu tun.

(IV) „Hedging" kann man ein universelles diskursives Mittel nennen. Dieses Phänomen stellt uns zur Verfügung, den Übergang von kategorischen Aussagen zu unkategorischen zu verfolgen.

Die Entwicklung der indirekten Kommunikation in der Wissenschaft zeigt eine besondere Denkenart, wenn jemand persönliche Meinung unscharf und implizit äußert. Diese Kommunikationsweise ist natürlich kein Selbstzweck, eine Aussage „fuz-

zy" darzustellen. Das fällt wahrscheinlich mit Worten des russischen Physikers und Mathematikers S. Kapitsa zusammen, dass alle physikalischen Theorien, mathematischen Modelle, verschiedenen Gesetze eine beschränkte Anwendung haben und asymptotische Eigenschaften aufweisen. Das beschleunigte den Prozess der kommunikativen Trennung in Wissenschaft. Und die Antwort auf diese Situation ist die Erscheinung des neuen Phänomens „hedging (Hecke)".

Drei Definitionen dieses Begriffes tauchen in Wörterbüchern auf. „Hedging" ist:

1) „Bezeichnung für Ausdrücke, die andeuten, in welchem Sinne bestimmte Exemplare einer bestimmten Kategorie zugeordnet werden";

2) „Adjektivische oder adverbiale Wendung, durch die angegeben werden kann, in welchem Maße in einer Sprache und dazugehörendem Kulturraum kategorisierende Aussagen im Sinne einer Repräsentativitätsskala möglich bzw. sinnvoll sind";

3) "Qualification and toning-down of statements to reduce the risk of what was said".

Bevor G. Lakoff den Begriff „hedging" in die Sprachwissenschaft eingeführt hatte, war schon eine Reihe von Untersuchungen dieses Phänomens unternommen. In „On the Semantic Structure of English" und „On Semantics" beschrieb U. Weinreich die Spracherscheinung, welche er den „metasprachlichen Operator" nannte. Er stellte fest, dass es Begriffe gibt, deren Designate selbst Aspekte der Sprache sind, und sie können weder grammatikalisch noch morphologisch gekennzeichnet werden. In allen Sprachen gibt es solche Begriffe (metasprachliche Operatoren), z.B. *so-called, like, true, real, eigentlich* usw.

Seit 1965 verwandte L. Zadeh „Fuzzy Set Theory" für die Modellierung der natürlichen Sprachstruktur. Dieser Theorie nach, wenn man einen Begriff (z.B. „Fisch") mit einem lexikalischen Modifikator markiert, so wird damit die Hinweisung auf einen Unprototyp eingeführt. Demgemäß werden die lexikalischen Modifikatoren nicht immer benutzt, das heißt, sie passen den "entfernten" und nicht dem Prototyp „nahestehenden" Begriffen. Deshalb ist die Aussage „Der Aal ist *etwas wie ein* Fisch" akzeptabel im Unterschied von "Der Hecht ist *etwas wie ein* Fisch".

Seit Anfang 1970 ist „hedging" ein Sprachbegriff. Die Untersuchung von „hedging" ist weiter mit Kommunikationsstrategien verbunden, und es wird meistens als ein Versuch betrachtet, die persönliche Unsicherheit zu verbergen. Selbst Lakoff definierte „hedging" als Wörter oder Wortverbindungen, deren Funktion ist die Dinge und den Sachverhalt mehrdeutig auszudrücken. Das bedeutet, dass eine Person nicht in vollem Maße in der Richtigkeit seiner Information sicher sei. Anstatt zu sagen „Dieses Mittel hilft Ihnen", benutzen die Kommunikanten „Heckenausdruck", um eine Distanz zwischen Wahrheit und Lüge zu verringern oder die Verantwortung für das Gesagte zu mindern – „Dieses Mittel kann Ihnen *vielleicht* helfen".

Der Begriff „hedging" wurde seit Neuem untersucht, wenn man entdeckte, dass „hedges" nicht nur zur ganzen Proposition, sondern auch zu ihrem Teil gehören. So können „hedges" von zweierlei Art sein: die Approximatoren, welche auf die ganze Proposition wirken (z.B., „His feet were *sort of* blue") und „shields", welche nur einen Teil der Proposition verändern („*I think*, his feet were sort of blue").

Die moderne Forschung der indirekten Kommunikation in wissenschaftlicher Sprache hat mit verschiedenen Prozessen und Erscheinungen zu tun. Betrachten wir hier jene, welche man mit "hedging" in Linguistik am häufigsten trifft.

Die Vagheit ist die erste Erscheinung in dieser Reihe. Sie entsteht in solchen unscharfen Aussagen wie „Der Objekt entwickelt *ziemlich* große Geschwindigkeit", welche man mit Zahlparametern präzisiert: „Der Objekt entwickelt *ziemlich* große Geschwindigkeit – 700 km/h". Gleichfalls kann man die Anzeige auf die Folge oder das Resultat heranziehen: "Der Objekt entwickelt *ziemlich* große Geschwindigkeit, um die Erdgravitation zu überwinden".

Die Quantifizierung ist die Bewertung eines sprachlichen Ausdruckes in einem formalen System. Die Bewertung widerspiegelt den Grad der Wahrscheinlichkeit einer Aussage durch lexikalische Modifikatoren „immer", „fast nie", "für manche" u.a. In „hedging" werden die Quantoren als „Fuzzy-Zahlen" betrachtet, weil sie dem System der Relationsbasis nahe stehen. Fuzzy-Quantoren sind implizit. Sie lassen die „neutralen" Aussagen (z.B. „Die Zwergsterne sind klein") durch die mit wenigerer Kategorisierung („*Fast alle* Zwergsterne sind klein") oder durch die mit größerer Kategorisierung („*Alle* Zwergsterne sind *sehr* klein") ersetzen.

Die Intensivierung ist die Zahlmodifizierung der Qualität, eine semantische Kategorie der Graduierung im weiteren Sinne. Die Adverbien funktionieren oft als Intensifikatoren und unterscheiden sich nach englisch-sächsischer linguistischer Tradition folgendermaßen: emphasizers („I *really* don't believe him"; „She simply ignored me"), amplifiers ("I *absolutely* refuse this method"), downtoners (kind of, sort of, quite, rather, more or less, partly, slightly, somewhat, a little, a bit, barely, hardly, scarcely). Dabei erscheint die Fuzzyfikation, die zu Zusatzkategorisierung führt ("She is *about* 20 years old"; "A girl is *fairly* pretty").

Die Graduierung ist eine semantische Kategorie, in welcher die Messwerte durch verschiedene Sprachmittel zum Ausdruck gebracht werden. Für moderne Wissenschaft ist es sehr wichtig solche Mittel der Datenrepräsentation zu finden, welche objektiv würden. Zum Beispiel, wenn die Temperatur eines Stoffes einen kritischen Stand erreicht (-270 °C), muss ein Forscher nicht nur die Tatsache der Messung feststellen („Das ist *die niedrigste* Temperatur"), sondern auch die letzten wissenschaftlichen Leistungen berücksichtigen („Das ist die niedrigste Temperatur für heute (bei diesen Bedingungen)").

Epistemische Modalität ist auch eine semantische Kategorie, die subjektive Meinung eines Kommunikanten wiedergibt, z.B. „*Vielleicht*, regnet es". Die Semantik der epistemischen Modalität wird durch eine problematische („Er ist *wahrscheinlich* draußen") oder kategorische („Ja, er ist *wirklich* da") Wahrheitstreue ausgedrückt.

Mitigation ist ein Mittel, mit dessen Hilfe der Sprechende (Schreibende) seine Aussagen mindert. Der Begriff „Mitigation" ist eng mit der Akzentuierung (accentuation) und der Abschwächung (attenuation) verbunden. Bei der Abschwächung wird die Bedeutung einer Aussage indirekt sein (z.B., „*I suppose* in a sense it is…"). Bei der Akzentuierung ist die Aussage aber betont, übertrieben (z.B. „I am *absolutely* convinced that the schools are wrong"). Es gibt keine strenge Differenzierung zwi-

schen diesen Erscheinungen. Alles hängt vom Kontext und von der illokutiven Kraft ab. So betrachtet man das Verb „think“ als diskursiver Marker der Unsicherheit (“Particularly *I think* you *probably* like the *sort of* clothes I like anyway”), aber in anderen Kontexten kann dieses Verb prosodisch sein (“I say *I think* they made up their minds before they started”).

Anhang

Der wichtigste Indikator der Vagheit im wissenschaftlichen Texte ist das Phänomen “hedging”. Die Mittel von “hedging” benutzt man häufiger, wenn Hypothesen oder Fuzzy-Daten in einem Texte ihre Wiederspiegelung finden. Aber nicht nur Texte, sonder auch wissenschaftliche Paradigmen bestimmen sprachliche Objektivität. Zum Beispiel, in der Quantenmechanik kann man das Gesetzt der Teilchenbewegung uminterpretieren, so dass wir unzuverlässige Feststellung eines Ereignisses durch zuverlässige Feststellung der Wahrscheinlichkeit ersetzen dürfen. Was selbst die Sprache betrifft, so ist der deutsche und englische akademische Diskurs durch Vielzahl von lexikalischen Modifikatoren gekennzeichnet. Im Russischen sind aber die Veränderungen der Propositionen öfter zu nennen. Linguistische Modifikatoren kommen nicht immer vor. An dieser Stelle finden wir graphische Zeichen, z.B. “20-30%”, was den europäischen Sprachen nicht geeignet ist.